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Factors That Contribute To Adverse Events Involving Care-Dependent Community Dwelling Older Adults And Their Caregivers.

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A thesis submitted in partial fulfillment of the requirements for the degree in Master of Science

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FACTORS THAT CONTRIBUTE TO ADVERSE EVENTS INVOLVING CARE-
DEPENDENT COMMUNITY DWELLING OLDER ADULTS AND THEIR
CAREGIVERS

(Thesis format: Monograph)

by

Dorothy Gotzmeister

Graduate Program in Health and Rehabilitation Sciences - Health & Aging

A thesis submitted in partial fulfillment
of the requirements for the degree of
Master of Science

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Abstract

The research on home and community care shows that when safely delivered it can be an efficient way to support elders who require care, potentially preventing a move into costlier institutional care. Learning from system-wide safety breakdowns that occur is necessary to establish appropriate prevention strategies. The purpose of this study was to identify the factors that contributed to adverse events in care-dependent community-dwelling older adults and their caregivers. Using a multiple case study methodology, eight falls were investigated using a comprehensive Systemic Falls Investigative Method. Using within case and across case analyses, a total of 280 contributing factors were identified, and grouped in four distinct themes of safety deficiencies: Everyday living has become risky, Limitations with supervision, Disconnects within the system, and Poor fall risk identification and follow-up. This study provides insights into how and why adverse events occur in home and community care, allowing for targeted systemic improvements.

Keywords

Older adults, seniors, adults 80+, community care, systems theory, health-related safety, adverse events, falls, case study research, SFIM.

Co-Authorship Statement

This thesis is the original work of Dorothy Gotzmeister, who is the primary author for all publications stemming from this material and lead researcher for all aspects of this study. Creation of this study was shared by D. Gotzmeister and Dr. A. Zecevic.

As thesis supervisor, Dr. Aleksandra Zecevic is a co-author of all ensuing material and publications of this thesis. In the role of committee members, Prof. Lisa Klinger and Dr. Alan Salmoni will be offered co-authorship for all ensuing material and publications related to this thesis.

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And finally, my family and friends, thank you for listening, proof reading, doing the dishes, and generally picking up the slack.

In youth we run into difficulties. In old age difficulties run
into us.

Beverly Sills

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Chapter 1

1 Introduction

Many older adults wish to “age in place”, referring to the desire to remain in one’s own home, surrounded by familiar belongings and familiar routines, as functional abilities decline during the aging process. Helping older adults age in place safely is beneficial to the healthcare system as well. On average, institutional care is costlier than home care (Miller, Hollander, & MacAdam, 2008). Many older adults are able to live on their own. Over half of elders over 85 years of age still live independently, with only 33.2% of elders over 85 years of age residing in long term care (LTC); 88% of adults who are between 65-75 years of age are independent with activities of daily living (ADLs); this decreases to 41% for those over 85 years of age (Institute for Life Course and Aging, 2007). The rapidly increasing demographic group of individuals over 65 years of age and especially the fastest growing group of those over 80 years (Statistics Canada, 2010), will translate into increased numbers of people requiring care and support as they age (Turcotte & Schellenberg, 2006). Within the home and community environment, this care assistance can come from family and friends, formal home care agencies, or not-for-profit organizations. Assistance within the home provides support to individuals who require help with daily functional tasks, such as dressing, bathing and meal preparation, or to those individuals who need professional health care for recovery after an illness or a hospital stay. Care within the home can also support those who require help for maintenance of current functional abilities or for slowing down the functional decline related to chronic degenerative conditions.

Most individuals will age in place safely, but adverse events (AEs) can occur. Health-related safety in the home and community is defined “as the minimization of the probability of preventable, unintended harm in community-dwelling individuals. Health-related safety aims to understand how and why adverse health events occur and to identify what breakdowns in the societal system expose individuals to hazards” (Lau, Scandrett, Jarzebowski, Holman, & Emanuel, 2007, pp. 840-841). These preventable events can threaten an individual’s ability to age in place successfully and without harm.

Although patient safety within hospitals has been addressed in a variety of ways, individuals being cared for in the community have been included but not specifically addressed in the patient safety discussions. This is changing, as demonstrated by the Canadian Patient Safety Institute's report *Safety in home care: Broadening the patient safety agenda to include home care services* (Lang & Edwards, 2006). As home based care delves into patient safety, it will be important to keep systemic and human factors in the forefront. Older adults aging in place are supported by many different people and outside agencies, often with their own distinct guiding policies and procedures, or, in the case of informal caregivers, no formal guidelines. Each person brings a mix of his or her own abilities and weaknesses, areas of experience and inexperience, biases and habits, in short— the human factors.

Preventing AEs will involve taking a close look at all the issues that link together to culminate in an undesirable event. Incidents and accidents are never the result of a single factor (Reason, 1990). Identification of the combination of factors that contributed to the AE may lead to an understanding of systemic problems and may allow for more targeted prevention of unnecessary harm. Targeted prevention has the potential to increase the safety and well-being of many community dwelling older adults and their caregivers, allowing for successful ageing in place, and reducing unnecessary healthcare expenditures. This thesis utilizes a systemic investigation method to take a closer look at the factors that contributed to AEs and to report findings that will guide future improvements of safety for community dwelling older persons aging in place.

1.1 Literature Review

1.1.1 Care Within the Home

Staying home with an increased level of support is preferred by older adults over the alternative of moving into a long term care (LTC) facility (Carstairs & Keon, 2009). The need for increased support is not inevitable as one becomes older, but the percentage who require help with activities of daily living (ADLs) increases as these individuals become older and potentially frailer (Kart & Kinney, 2001; Smith, 2001). Supports for those desiring

to age in place can come from formal homecare agencies (providers), family and friends (informal caregivers), and not-for-profit agencies.

1.1.1.1 Formal Homecare

Formal Homecare services (which will be Homecare with a capital for the purposes of this thesis) offer supports that allow an individual to remain living in the community and prevent admission to a LTC. Homecare services are designed to supplement the care older adults are able to provide for themselves or to supplement the assistance provided by family and friends. Homecare programs and services offered in each region throughout Canada are not standardized, but generally services include nursing care, services from allied health professionals (most often dietitians, occupational therapists, physical therapists, and social workers), and non-medical home support services. The non-medical home support services are usually provided by personal support workers (PSWs). PSWs can be assigned to assist with activities of daily living (ADLs), such as bathing, dressing, grooming, toileting, and transfers, and a few instrumental activities of daily living (IADLs), such as basic home cleaning, meal preparation, and laundry. The provision of equipment such as hospital beds, commodes, and transfers aids is often funded on a short term basis. The amount and type of non-medical home support services funded by the provincial government and eligibility requirements vary throughout Canada and within each province. For example, in Saskatchewan, Manitoba, and Quebec the cost of Homecare services are not to exceed the cost of LTC (Canadian Home Care Association, 2008). In Ontario, Prince Edward Island and Nova Scotia's acute care program, guidelines are in place predefining the amount of dollars or the number of hours allowed per individual. In British Columbia, Nunavut, and the North West Territories there is no established maximum limit.

Most Homecare services within Ontario are delivered by agencies contracted to a local Community Care Access Centre (CCAC), some of which are for profit agencies, and others of which are not-for-profit agencies. Each agency is required to follow the requirements and regulations set out by the region's CCAC. The CCAC is overseen by a Local Health Integration Network (LHIN), which receives funding from the provincial Ministry of Health. The LHIN provides a budgeted amount of money to the CCAC each year

and gives guidance for how the money is expected to be spent. The CCAC assigns a case manager to each client on the Homecare program, and the case manager determines which type and the frequency of services the client will receive based on the Resident Assessment Instrument for Home Care (RAI-HC). The RAI-HC is a standardized assessment tool that is completed face to face with clients, within six weeks of admission to the program. The tool has domains related to function, health, social support, and service. All case managers receive standardized training on this tool and use the results of the RAI-HC to inform and guide the planning of the amount of home services to be contracted from outside agencies. Case managers are directly employed by CCAC.

The importance of home based care within the healthcare system has become increasingly evident as healthcare costs increase. In 1996 healthcare expenditures per capita was just over \$2 500; in 2010 this had increased to \$5 659 per capita (Canadian Institute for Health Information (CIHI), 2012; Ontario Health Quality Council (OHQC), 2010). Even with a constant dollar rate to account for inflation, the comparable cost per capita in 2012 was over \$4 000. According to the CIHI's online cost estimator (<http://www.cihi.ca/cihi-ext-portal/internet/en/applicationnew/spending+and+health+workforce/spending/cihi020209>), the average cost for a patient who is in the hospital and awaiting placement into LTC was \$8 499 . The average cost for one day in an Ontario hospital was \$842 (in 2011,) and it was estimated that 16% of hospital beds are occupied by individuals requiring an alternate level of care (i.e., LTC) (Ontario Home Care Association, 2011). Frequently it is the need for non-medical services that prompts the move of these individuals to LTC (Chen & Thompson, 2010; Williams et al., 2009). It may be possible to meet the same level of care within the home environment, with the appropriate amount of Homecare (Ontario Health Quality Council, 2010; Williams et al., 2009).

Supporting individuals at home is to the advantage of the healthcare system., Miller and her colleagues reported that on average the cost of provincially funded Homecare was six times less than the cost of LTC, which is supplemented by the province (\$9 104/person/year versus \$65 175/person/year) (Miller et al., 2008). Even when the (minimum) wage replacement for informal caregiving and other expenses to the family were taken into account, the comparable cost was \$37 008/person/year for community care and \$87

376/person/year for facility care. Utilizing Homecare services to replace alternate levels of care in the hospital and LTC has the potential to save the Ontario healthcare system \$150 million each year (VanderBent & Kutcha, 2010). However, although the cost efficiency of Homecare for the healthcare system is evident, it also should be kept in mind that the lower cost of Homecare is partially based on the support provided by informal, unpaid caregivers.

1.1.1.2 Informal Caregivers

The support of informal caregivers is essential for older adults to remain in their home successfully in advanced old age. According to the CIHI (2010) only 2% of those receiving Homecare manage without any additional informal care. Non-medical home support services provided through the Ontario Ministry of Health are usually not sufficient to meet all of the needs of an older adult who wishes to age in place. Moreover, an individual's specific care needs may not qualify for government covered services. In those situations it takes the efforts of unpaid, informal caregivers, such as spouses, children, grandchildren, siblings, other family members, friends, and neighbours to fully support the person and prevent institutionalization (Miller et al., 2008). An estimated 80% of assisted support within the home is provided by unpaid caregivers (CIHI, 2010), who often do not have previous experience in healthcare (Lang, Edwards, & Fleiszer, 2008; MacDonald & Storch, 2010).

Caregiving often begins with small IADL related tasks, and gradually grows. The role is often assumed due to love, marriage, family ties, friendship, or out of a feeling of obligation, when there is no one else to provide assistance (Dow & McDonald, 2007; MacDonald & Storch, 2010). Many caregivers are unaware of the future requirements of such a role and the potential for slow, exponential growth of their responsibilities (MacDonald & Storch, 2010). Over time this can create stress related decrease in the caregiver's health, increased risk of depression, and increased physical pain (CIHI, 2010; Dow & McDonald, 2007; MacDonald & Storch, 2010; Ranmuthugala, Nepal, Brown, & Percival, 2009), especially if caregiver's capabilities and limitations are not taken into consideration (Henriksen, Joseph, & Zayas-Caba, 2009; National Research Council, 2011). In Miller et al.'s (2008) study, 53% of the caregivers for veterans were over the age of 65,

and 40% were over the age of 70. It is also vital, therefore, to take caregivers' limitations into account because older caregivers often have health issues and care needs of their own.

Caregivers are essential for help in and around an elder's home. They provide assistance with grass cutting, snow shoveling, and grocery shopping, as well as personal care such as bathing, dressing, transfers, and medication management. Informal caregivers also provide emotional support, monitor the needs of the care recipient, and coordinate the formal, paid care providers within the home (Williams et al., 2009). According to CIHI, caregivers in Canada provide an average of 18.4 hours of care each week (CIHI, 2010). The estimated market value of informal caregiving for adults over the age of 65 years is \$25-26 billion per year within the province of Ontario alone (Miller et al., 2008). Caregivers play an important role in the success of care within the home, allowing older adults to remain in the community and reducing healthcare system costs.

1.1.1.3 Not-for-Profit Agencies

Not-for-profit agencies provide services that enable older adults and their caregivers to continue with care in the home. The agencies often rely on volunteers and include programs such as meals on wheels, friendly visitor programs, transportation to medical appointments, care giver support groups, day programs, and library book exchange. Program fees are kept to a minimum to allow for increased accessibility and are often subsidized by government grants, fund raising, and public donations. The Alzheimer Society, Red Cross, and Victorian Order of Nurses (VON) are some examples of not-for-profit agencies that provide programming to assist older adults with aging in place.

1.1.2 Safety of Care-Dependent Older Adults in the Home and Community

Harmful incidents or adverse events increase the use of healthcare resources and increase costs to the healthcare system as a whole. Beyond healthcare dollar utilization, AEs have personal consequences to the health, well-being, and life potential of those experiencing the AE (Smartrisk, 2009). The term "adverse event" has been defined within healthcare safety literature in different ways, as described in Appendix A. For the purpose of this study an

adverse event (AE) is defined as ‘an unintentional event that could have resulted, or did result, in unnecessary preventable harm’. The prevention of these events, whether harmful or not, is in the best interest of the healthcare system and older adults.

Baker et al. (2004) produced one of the first reports with AE rates within the Canadian healthcare system. He examined the rates of AEs within hospitals, finding an AE rate of 7.5%. Lang and Edwards (2006) proposed expanding the studies of patient safety to include home care. The authors identified 10 themes that describe differences between safety in hospital care and home based care: 1) family is the unit of care; 2) safety of the client, family, caregivers, and providers is linked; 3) the setting of individual homes is unregulated and uncontrolled; 4) there are multiple dimensions of safety within the home setting (physical, emotional, social, and functional); 5) the role of autonomy and choice for clients, families, and caregivers; 6) isolation is a factor for clients as well as families and caregivers; 7) communication breakdowns between provider and client as well as between providers; 8) the maintenance and development of knowledge, skill, and competence for providers; 9) the changing focus of home care services from prevention, health promotion, and chronic care to more acute service provision; and 10) the human resource challenges. Addressing safety within home care is more complex than it is within hospitals.

In 2006, Lang and Edwards (2006) stated “there is an urgent need for research on safety in home care” (p. 27). Consecutive studies have moved onto examining safety and prevalence of AEs within the formal home care system (Doran et al., 2009; Johnson, 2006; Madigan, 2007; Masotti, Green, Shortt, Hunter, & Szala-Meneoak, 2007; Sears, 2008). Appendix B contains a comparative table of one hospital and five home care studies that examined prevalence of AEs in health care. Reported AE rates varied from 5.5% to 13.2%. The variation was most likely due to the different inclusion/exclusion criteria for the case files reviewed and the inclusion/exclusion criteria of the AE categories used. Both Johnson (2006) and Sears (2008) reported that almost 30% of the events examined in their studies were preventable (26.9% and 32.7% respectively). Of the AEs identified in the Canadian studies, the most prevalent were related to falls (24.6%-61%) and medications (16.4%-23.1%). Doran et al. (2009) found that 11% of the 238 958 cases reviewed had experienced a new fall; that is 26 285 falls.

Falls can occur at any time of life, but the risk of injury after a fall was nine times greater when a person was over the age of 65 years (Smartrisk, 2009). Peel (2011) reviewed 15 studies examining falls in older community dwelling adults and found that the prevalence rates for participants who had a fall in the past year varied from 19.3% up to 60%, where the oldest old had the highest rates. The accumulated effects of aging and co-morbidities (intrinsic factors) increase an older adult's susceptibility to environmental (extrinsic) factors. Consequences of falls cost the Canadian healthcare system \$2 billion dollars in direct care costs in 2004 (Smartrisk, 2009).

Inappropriate medications and medication mismanagement are costly, leading to a 1.5-2 times increased risk of a greater number of physician and emergency room (ER) visits (Fick, Mion, Beers, & Waller, 2008). Adverse drug reactions account for 4% of hospital bed capacities, with an eight day hospital stay on average (Pirmohamed et al., 2004). Over 35% of those over the age of 60 are taking more than five medications, with polypharmacy leading to increased adverse drug reactions that result in falls, declined functional capacity, and decreased cognition (Geller, Nopkhun, Dows-Martinez, & Strassor, 2012).

Decreasing AEs would have many benefits for the healthcare system and for those who experience them. Preventing these events requires identification of the factors that contributed to the incident.

1.1.3 Contributing Factors to Adverse Events

A better understanding of the factors that contribute to AEs is needed to improve safety and decrease the chances of a harmful incident occurring to care recipients or their caregivers (Doran et al., 2009; Masotti, McColl, & Green, 2010; Sears, 2008). Older adults, and those that care for them, are a heterogeneous group of individuals with varying skills, knowledge levels, abilities, and disabilities. Due to normal aging process all older adults experience some degree of decreased strength, decreased balance, decreased endurance, and decreased vision (Cox, 2006). This affects how they are able to manage caring for themselves and their ability to manage carrying out instructions given to them from healthcare providers, such as the doctor and nurse. In addition, each home environment is different, potentially enabling or hindering the completion of daily tasks. Caregivers and care providers comes into the older

adult's home with their own experiences and areas of expertise, as well as gaps in expertise. If care demands "exceed a person's capabilities, the safety, efficacy and efficiency of that care will suffer" (National Research Council, 2011, p. 1). Due to the multiple players involved, human capabilities and limitations—also known as the human factors, are another of the multiple factors affecting safety for care-dependent individuals who are aging in place and their formal and informal caregivers.

Research on safety in the Homecare system has attributed AEs to multiple contributing factors. Johnson (2006) found that 30.8% of the AEs were client related, 42.3 % were caregiver related, 50% were associated with case manager issues such as not introducing services in a timely manner, and 4.3 % were physician related. Sears (2008) found that 29.5% of AEs were related to home care workers, 27.9% involved caregivers, and 52.6% events involved the care receiver (self-care). Sears reported that the majority of AE related deaths reported in her study were related to the actions of the care recipient and caregiver. The participants in Masotti et al.'s 2007 study identified a number of factors that may contribute to the occurrence of AEs. Factors such as communication problems, clients with complex needs, insufficient training, inappropriate home environments, delays in service, moving care responsibility to clients and caregivers, failure to identify and control for risks, use and misuse of equipment, and insufficient human and financial resources. The work of Masotti and colleagues (2007) moved the focus from the individuals at "fault" to broader systemic issues.

In a more recent study, Masotti et al. (2010) identified patient-level as well as organizational and system-level characteristics associated with causes and increased risk for AEs. Patient-level causes included increased age and co-morbidities, gender, depression/cognitive impairment/functional status limitations, patient compliance, and living alone or not having a caregiver. Organizational and system-level characteristics included communication issues and collaboration, team experience, team workload, medication errors, unrecognized polypharmacy, drug label instructions, inadequate patient monitoring, and assessment. Authors concluded that preventing or reducing AEs would require targeted multi-level changes and further research. One area of future research suggested was to examine the

“multi-level variables associated with the occurrence of adverse events (e.g. patient/provider/system-level variables associated with causes and consequences)” (p. 121).

The majority of research studies identified contributing factors based on retrospective chart reviews and opinions of home healthcare experts. These methods are insufficient to provide a full, thorough investigation of contributing factors due to hindsight bias, which affects how a situation is viewed after the fact when an outcome is known. This bias causes people to overestimate what they knew before an incident and to overestimate what others may have known beforehand (Woods & Cook, 1999). Without a thorough investigation method that acknowledges hindsight bias, investigators and researchers completing case chart reviews run the risk of believing that the individuals directly involved at the time of the incident knew more than they actually did or were aware of more about their situation than they actually were. To ensure there is comprehensive identification of the contributing factors that linked together and affected one another to result in the AE, a thorough reflective investigation that involves interviewing the individuals affected and the others involved is necessary.

1.2 Systems Approach to Investigation of Adverse Events

A system is a set of interdependent elements interacting to achieve a common goal (Institute of Medicine (IOM), 1999). The elements of a societal system may be human or non-human, consisting of people, places, and institutions. It is important to realize that a person does not age in place without context. To understand how AEs occur and what factors contributed, it is essential to use a systems approach and create an understanding of the societal system surrounding a community dwelling person and how factors within each component of the system affect the other components. The sharp-end factors of an AE describe active failures related to the individuals directly involved in the incident. Blunt-end factors of an AE describe latent system-wide factors, removed from the direct control of the individuals immediately involved in the incident. The actions of an individual (sharp-end factors) are the result of multiple factors within each component of the system (blunt-end factors) that have intertwined to create a situation that may or may not result in harm. Though unsafe actions can be seen as a result of human error (Miyagi, 2005), human error needs to be treated as a

consequence of system vulnerabilities and not the cause (Henriksen, Dayton, Keyes, Carayon, & Hughes, 2008).

If an investigation of an event is conducted and only the immediate sharp-end factors are identified, the latent underlying systemic causes will be missed and ignored. In ignoring the underlying causes, the chance to ameliorate the situation from reoccurring in the future is lost, and the latent danger remains (Miyagi, 2005; Reason, 1990; Woods & Cook, 1999). Focusing on improving safety culture does not deal with poor design of the system. This may lead to downplaying the importance of designing a system that makes it easy to do the right thing and harder to do the wrong thing, putting the responsibility for error avoidance back onto individuals operating within the system (Rollenhagen, 2010). Individuals do play a role, but individuals are living and functioning within a larger system that calls for them to act in one way or another.

Insight is needed to uncover and understand the options an individual had when performing an unsafe act that led to an AE. Humans will make errors (Ayeko, 2002; IOM, 1999), but it is possible to minimize the prevalence and consequences of those incidents, with an understanding of the unsafe conditions that combined with unsafe acts at the time of the event (Ayeko, 2002; IOM, 1999; Leape, 2004; Zecevic, Salmoni, Lewko, & Vandervoort, 2007). Recognizing and understanding how the system and its policies combine with the actions of the multiple players who operate within it can have a positive influence on the safety of older adults requiring support (Henriksen et al., 2008). To gain this recognition and understanding, use of an investigation method is needed that identifies and examines how multiple contributing factors within various levels of the system combine to result in an AE.

1.3 Systemic Investigation Method

A systemic investigation method is required to gain that deeper understanding of how to optimize safety for those aging in place. The Systemic Falls Investigation Method (SFIM) is one such tool. The SFIM is a six step method designed specifically to examine the factors that contribute to falls in seniors (Zecevic et al., 2007; Zecevic, Salmoni, Lewko, Vandervoort, & Speechley, 2009). It is based on the Integrated Safety Investigation Methodology (ISIM) used by the Canadian Transportation Safety Board to investigate

accidents in aviation. Detailed description of SFIM method is available elsewhere (Zecevic et al. 2007) and a summary is provided in the Methods section of this thesis. Only a brief description of its six steps is presented here.

Step one of SFIM involves collecting data using FSHEL tool based on five categories: the individual who fell, the software (e.g., policies and procedures), the hardware (e.g., equipment), the liveware (e.g., care providers, caregivers, social networks), and the environment (e.g., natural and physical). Step two is to develop a sequence of events and to identify the safety significant events. Step three consists of examining the safety significant events and connecting unsafe conditions with unsafe acts or unsafe decisions. The fourth step is to situate the identified contributing factors within one of four levels of the Swiss Cheese Model of Accident Causation: unsafe acts and decisions, preconditions, supervision and organizational issues. In step five the investigator summarizes all contributing factors to identify the safety deficiencies. The final step, six, is to assign priorities and develop a safety action. The design of the SFIM allows for a comprehensive investigation, examining system and human factors that contribute to an incident. The tool has been used to investigate falls in community (Zecevic et al., 2009), acute care and rehabilitation hospitals, assistive living and long term care facilities (Madady, Zecevic, Salmoni & Young, 2013; Zecevic et al., 2010; Zecevic, Li, Davy, Halligan, & Kothari, 2010). Although it was designed with falls in mind, the SFIM has the potential to investigate any type of AE in health care.

1.4 Summary

Older adults will require more health care and more support to safely stay in their own homes and age in place. With the baby boomer generation beginning to turn 65 years of age, the numbers of people requiring care in the home will increase. An intricate system, with multiple players, surrounds the care-dependent older adult and their caregivers. When these interlinked systemic components interact well, AEs are minimized. When this complex system does not interact well, unnecessary harm can result. Falls as AEs can result in decreased quality of life and injuries that create additional costs to the healthcare system; they are caused by variety of factors and increase in prevalence with advanced age.

Understanding the factors that contribute to falls will help with targeting appropriate interventions, to keep the home and community safe for older adults and their caregivers.

1.5 Purpose

The purpose of this study was to identify the factors that contributed to AEs, falls in particular, in care-dependent community-dwelling older adults and their caregivers. Specific objectives were to:

- Conduct case studies using the SFIM to identify specific safety deficiencies at the four levels of Swiss Cheese Model of Accident Causation that contributed to the fall events.
- Provide evidence on how the system-wide latent factors combine with the actions of people at the sharp end to cause AEs in care-dependent community dwelling older adults and their caregivers.
- Identify the themes from patterns and similarities across multiple case studies.
- Discuss the implications of safety breakdowns and direction for their improvements.

1.6 Positioning the Researcher

This study focus is of personal interest. I have been employed as an occupational therapist and worked as a provider in the formal homecare sector for over 15 years, assisting individuals with problem solving to find solutions that allow safe continued occupational participation within the home environment. As eligibility for government funded service changed, I saw individuals and families who were struggling when their PSW support hours were decreased or when specific services were declined. At the same time the clients on my caseload were getting older, frailer, and more acute, and I became interested in the ways society could best support older adults to safely age in place. By studying the factors that contribute to AEs, I hoped to learn how systemic factors connected with individual factors to restrict safe occupational performance and result in an AE. Through this study I hope to enlighten others about the roles we all play in keeping older adults safe and how choices at one societal level have consequences on other levels.

Chapter 2

2 Methods

2.1 Philosophical Anchor

My research position is that of interpretivism. I agree with Finlay (2006) that perceptions and past experiences affected how the data collected was interpreted. I have subtle realism ontology. As a subtle realist, I believe that a reality does exist, but I am aware that this reality can be affected by subjectivity of the researcher and the participants. I acknowledge that a perfect representation of reality is hard to obtain (Finlay, 2006; Guba & Lincoln, 1994). As such, in order to represent reality as closely as possible in my interpretations of the data, I, as the researcher, looked for external verification from the participants, research literature, and researcher collaborators when interpreting data to ensure the results were trustworthy and authentic.

2.2 Methodology

To ameliorate AEs and improve safety of older adults, it is important to understand how various factors at multiple levels of the system linked together. Reason (1990) discussed that a case study methodology can provide valuable information about causal factors and their interactions. A collective case study research approach was selected for this project because case study methodology allows for an in depth analysis of complex real-life situations (Creswell, 2013; French, Reynolds, & Swain, 2001; Stake, 2005). “The real value of case study lies in the particularity of individual experience that may provide useful examples for larger numbers of people.” (Salminen, Harra, & Lautamo, 2006, p. 7). When using a case study design, the researcher completes an intensive investigation of a situation and examines the various factors that brought about the specific outcome. In this study, the outcome is the fall. This comprehensive investigation provides the basis for in-depth detailed documentation of the case, allowing for “naturalistic generalization”. Naturalistic generalization refers to generalization for others who are able to recognize their own experiences in the case (Stake, 2005). A case study can also “be a disciplined force in setting public policy and reflecting on

human experience. Vicarious experience is an important basis for refining action options and expectations.” (Stake, 2005, p. 460). It is hoped that the results of this research will influence public policies and allow others to reflect on the complexities that contribute to the unsafe situations surrounding older adults. It is important to note that case study research is different from case examples or case reports, which are primarily used for professional education (Salminen et al., 2006). Case study research is intensive and time consuming. Data are collected from multiple sources and in multiple ways to ensure that the complexities of the case are captured.

The methods and procedures utilized here were consistent with qualitative methodology and case study research. The researcher independently completed all investigations in the field, utilized multiple data sources, and sought external verification throughout the study. In an attempt to ensure trustworthiness, during the course of the study the author completed reflective journaling and conducted reflective discussions with the supervisor and members of advisory committee. Subjective reflection, as described by Finlay (2002), throughout the research process allowed for an increased understanding of how the information gathered was interpreted based on the personal reactions of the researcher.

2.3 Procedure

2.3.1 Setting and Recruitment

The focus of the study was on community dwelling seniors aging in place, and therefore the study was completed in a community setting. In January 2011 the researcher approached the East Elgin Family Health Team (EEFHT) to collaborate on this research project. The EEFHT readily agreed to participate and assist with participant recruitment. One family physician and one nurse practitioner from this team were the main contacts. The EEFHT is located in eastern Elgin County and serves the town of Aylmer and townships of Bayham and Malahide, with approximately 25,000 mostly rural residents. The EEFHT is a primary health care team of five family physicians, three nurse practitioners, and one social worker. The team has been serving the community since 2005. Partnering with EEFHT allowed for recruitment of older adults who were Homecare recipients as well as older adults who were

not receiving their care from Homecare. Ethics approval was received from the University of Western Ontario (Appendix C).

2.3.2 Participants

2.3.2.1 Primary Participants

The primary participants were fallers who were recruited directly by the EEFHT. Purposeful sampling was used, choosing cases that offered the greatest opportunity for learning. Investigating falls in older adults who received care or provided care allowed for the examination of the more vulnerable individuals, with more complex situations contributing to the AE. The inclusion criteria were: an individual over the age of 65 years, who had experienced a fall in the past 30 days. The participants were selected if they required assistance to remain living in the community or were the provider of such assistance (e.g., caregiver).

Individuals were excluded if they did not speak English or were not willing to sign the written consent form. Participants also could not be the researcher's current clients for occupational therapy services. For participants with cognitive impairments ascertained by a MMSE score lower than 21, consent was sought from the legally authorized substitute decision maker.

2.3.2.2 Secondary Participants

A second group of participants were identified during the case investigations and were recruited by the researcher. These participants were individuals who were able to provide relevant information about the occurrence of the fall or the factors that contributed to the event. Data collection from multiple sources allowed for triangulation of data. Secondary participants included witnesses and others with information about the event, the primary participant, the environment, or the organizational factors. The secondary participants included other family members and formal caregivers, doctors, nurses, therapists, Community Care Access Centres (CCAC) case managers, and friends, as well as others with specialized knowledge about contributing factors and circumstances related to the

contributing factors. Only secondary participants who gave informed consent for the researcher to use their comments were included in the study. Some secondary participants were identified by the primary participants; other potential information sources were identified in discussion with the tertiary workgroup participants.

2.3.2.3 Tertiary Workgroup Participants

As case studies were developed, they were reviewed and discussed with up to four members of a SFIM workgroup as well. All members of the workgroup completed a two day training session on SFIM and conducted investigations in other research projects. In addition to the researcher, the workgroup members were: the SFIM creator, who had six years of experience with SFIM investigations; an experienced physical therapist and a doctoral candidate in the health and rehabilitation program; a second year masters student working on a project related to falls occurring in stroke survivors; and a second year kinesiology masters student interested in patient safety and diverse systemic investigation methods.

2.3.3 Data Collection

The Systemic Falls Investigation Method (SFIM) was chosen as the data collection tool. Previous studies have demonstrated that it is an effective method for identification of system-wide contributing factors to falls that occur in a community setting with an older adult population. In October of 2011, the researcher attended a two day workshop on how to utilize the SFIM and use the web-based SFIM Database. The workshop was taught by Dr. A. Zecevic, the original author of the SFIM (Zecevic et al., 2007).

In January 2012, the researcher attended a staff meeting at the EEFHT and explained to the staff members the purpose of the study, study protocol, and participant recruitment process. Identification of eligible participants and a suggested script for participant recruitment was shared with staff (Appendix D). Envelopes containing a letter of information and consent form (Appendix E) were provided to staff to deliver to the potential participants.

From late January 2012 to early June 2012 EEFHT physicians and nurse practitioners approached eligible individuals with an invitation to participate in the study. When an individual agreed, the recruiter ensured that the potential participant obtained a letter of

information and completed the contact information form (Appendix F). The EEFHT then contacted the researcher by telephone to pick up the contact information form. Once the researcher had the contact information, the researcher telephoned the primary participant to arrange for an initial interview. All interviews were completed within two days of receiving the contact information.

The first interview involved the primary participant and his/her caregiver. In the situation where the primary participant was a caregiver, the care receiver was also involved in the interview. The interview started with reviewing the letter of information, answering any questions and obtaining consent. Once consent was received, the Mini Mental State Exam (MMSE) (Appendix G) was completed (Folstein, Folstein, & McHugh, 1975). The MMSE is a cognitive screening tool that can check for potential cognitive impairment and is used in the context of SFIM data collection to establish credibility of facts provided by the faller. One participant did not complete the MMSE. This participant went to hospital after the fall where she experienced confusion that was not evident prior to the fall. She described minor difficulties with learning new tasks and had her daughter provide most of the information for the investigation. For the purpose of this study, her cognitive status was labeled as mild cognitive impairment. When the MMSE score was less than 21, all data obtained from the faller had to be triangulated and confirmed with at least two alternate information sources. Only one participant had a score lower than 21 and the above mentioned protocol was followed. After the cognitive screen, the SFIM investigation process commenced.

2.3.3.1 Systemic Falls Investigation Method Process

A brief overview of the SFIM was given in chapter one. This section provides further details and examples to allow for study replication. Though separated into six steps, the first two components were a cyclical process, with continual researcher reflexivity and member checking with participants to ensure triangulation and credibility of the data collected, and to produce a summary of the event.

Step one: Completion of a semi-structured interview at the home of the faller (interview template, Appendix H). An interview was conducted with the faller and his/her

caregiver, or care recipient if the event occurred with the caregiver. The objective of the interview was to collect data using the F-SHEL framework:

- F—facts about the faller; includes their physical, physiological, psychological and psychosocial characteristics
- S—software; includes training, policies and procedures, manuals, and/or checklists that were in place, either for the care procedures of the faller or for any equipment that was in use
- H—hardware; includes equipment used, mobility aids, transfer aids, bath aids, layout of items, display screens, footwear used by individuals involved at the time of the fall
- E—faller's environment; includes internal conditions such as lighting, temperature, noise, floor conditions and external environment such as weather, community conditions/particularities
- L—liveware surrounding the faller; includes the other people involved, witnesses, healthcare providers and agencies, other family members, peoples' attitudes, social networks, communication

All interviews were audio recorded. In addition photos were taken of the home environment, aids used at the time, and location of the fall. Recreation of the event occurred in this initial interview. The initial interviews with the primary participants provided information for steps two and three and on average took 45 minutes to an hour and a half to complete.

Step one also involved a review of medications, review of health records, and on-line searches for additional details such as building codes. Any secondary participants identified at the time of the initial interview were contacted, had the nature of the study explained to them, verbally or by email, and asked if they wished to participate in the study. When secondary participants agreed to an interview, he/she was presented with a letter of information and asked to sign a consent form (Appendix I). Interviews with secondary participants took on average 10 minutes to an hour (interview template, appendix J). Each of these processes took half an hour to an hour to complete.

Step two: Develop the sequence of events that led up to the event. This step was initiated by the researcher after the initial interview and involved developing a chronological hypothesis of the sequence of events that led to the fall. The sequence of events was then revised and confirmed through additional data collection and the events that were safety-significant were identified. Safety significant events (SSEs) were acts and decisions that directly contributed to the AE. An SSE was determined by answering the following questions about each event in the sequence:

- Was this task undesirable?
- Was this task non-standard?
- Was this task linked or potentially linked to another undesirable event?
- Was this task one of alternative actions or options available?

If the answer was ‘yes’ to any of the questions, the act was classified as an SSE. Each SSE was then examined more closely by asking further questions regarding the “why”. For example: Why was this task undesirable? Why was this task completed in a non-standard format? Why did the individual choose to complete this action over another one? The “why” questions uncovered further need for data collection and led to interviews with additionally identified secondary participants, further observations, or further review of additional data sources, such as written materials on policies or medical records.

At this point the sequence of events and identified SSEs were reviewed with workgroup participants to discuss potential gaps in the sequence of events and to determine what further data were required to answer the “why” questions. Follow up interviews were completed at the participant’s home, place of work, over the telephone, or by email, depending on the information required and the preference of the participant. All of the interviews and follow-ups occurred within four weeks from the first contact with the faller.

Once the sequence of events was clearly articulated and workgroup members were satisfied with the depth and thoroughness of investigation, a narrative summary of the fall was written and the de-identified data were entered into the web-based SFIM database. Data stored in SFIM database were stripped of all personal identifiers and assigned a unique code. The SSEs and their contributing factors were further analyzed for step four of the SFIM.

Step three: Generic Error Modeling System (GEMS). In the SFIM, unsafe acts and decisions are analyzed further using the Generic Error Modeling System (GEMS) (Reason, 1987). This system of modeling human error is used to determine:

- the mindset of the person at the time of the event
- if the error was skill-based, rule-based, or knowledge-based
- which failure mode corresponded to a skill-based slip or lapse: inattention or over-attention
- which failure mode corresponded to a rule-based or knowledge-based mistake: misapplication of good rules, application of a bad rule, biases, or heuristics.
- which failure modes corresponded to a knowledge-based adaption: biases or heuristics.

More detailed description of GEMS analysis is available in Reason (1987). This analysis was completed by A. Zecevic for all case studies and results were not included in this thesis.

Step four: Swiss Cheese Model of Accident Causation analysis. The fourth step of the SFIM maps contributing factors identified in step two to the Swiss Cheese Model of Accident Causation developed by Reason (1990) and adapted for the SFIM by Zecevic et al. (2007). The four levels of this model include: unsafe acts and decisions, preconditions, supervision factors, and organizational factors. Each “slice of the cheese” represents a layer of defense where an AE could be prevented. Holes in the defense layers can be both active failures and latent conditions. For an AE to occur, “holes” on all four levels of defenses must line up to allow an accident arrow to connect a vulnerable person and a hazard (Figure 1). During this analysis the researcher identified the level of Swiss Cheese Model of Accident Causation for each act, decision, and contributing factor. These data were entered into the SFIM database to create a summary table of all contributing factors separated into the four levels.

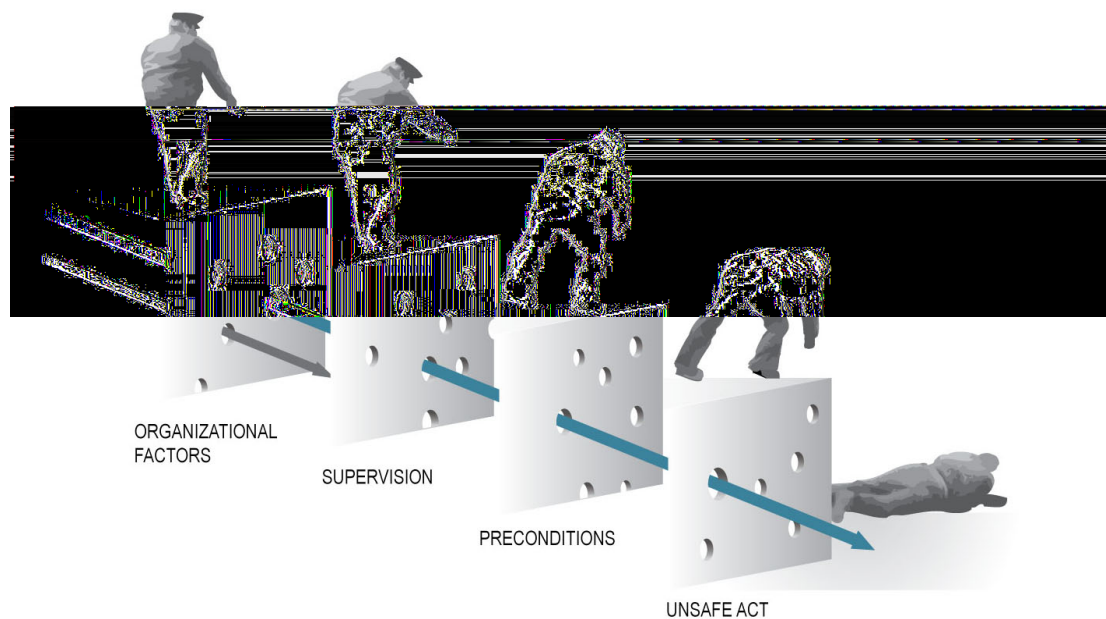


Figure 1 SFIM's use of the Swiss Cheese Model of Accident Causation © Aleksandra A Zecevic 2007.

Step five: Identifying Safety Deficiencies and Risk Assessment. At this time in the within-case study analysis, the unsafe conditions and underlying factors were reviewed to determine which of the factors had the most potential for adverse consequences, how adequate the existing defenses were, and how potentially ameliorable each factor was. When SFIM is used in healthcare organizations, the investigator works together with safety teams to assign risk priorities and examine adequacy of current defenses. Considering that this was a community based study, the level of risk was estimated as high for all safety significant events and all safety deficiencies were given a high priority.

Step six: Development of safety actions. The final step in the SFIM investigative process is to develop safety actions. The job of the SFIM investigator is to find what went wrong and inform those in a position to implement changes. Those directly related to an identified safety deficiencies are best able to determine how to correct the situation to close the holes and improve defenses. This improves the safety not only for individuals involved in the investigated AE, but for many other community dwelling older adults aging in place. Knowledge translation activities have already involved sharing the SFIM reports with the

county housing authority and the family health team. Plans are underway to share the results with the Public Health Unit and the South West LHIN.

2.3.4 Data Analysis

Data analysis occurred in two phases. The first was within-case analysis that occurred during the SFIM investigation process, as described above. The data collected from interviews and other sources were reviewed and discussed with at least one and up to four other researchers. This allowed for multiple perspectives, generation of hypotheses and expansion of the investigation's scope to additional contributing factors. This process facilitated credibility and improved accuracy of the collected information (Ballinger, 2006; Creswell, 2013; Salminen et al., 2006). Each contributing factor was further analyzed for placement within the system-wide framework provided by the Swiss Cheese Model of Accident Causation. Upon completion of the investigation, the secondary reviewer (AZ) thoroughly reviewed the final report and sequence of events of each case study for accuracy, consistency, coherence, and quality.

The second phase of data analysis focused on similarities, patterns, and repetitions between case studies and lead to identification of reoccurring themes. Eight summary tables, one for each case, of contributing factors were analyzed using content analysis. This process involved three researchers, and two cycles of analysis. Peer review, combined with prolonged engagement with the data, was employed to increase the credibility of findings (Ballinger, 2006; Creswell, 2013). The first stage of this analysis involved line by line coding of the Swiss Cheese Model of Accident Causation tables, independently completed by three researchers. The author then amalgamated the three code lists and met with the other two researchers to discuss the final code list, establish consensus of all coders, and ensure that the list was exhaustive and that each code was clearly defined and bounded (French et al., 2001). Once the amalgamated coding list was completed, two researchers (the author and supervisor AZ) independently re-coded all the contributing factors. Some minor discrepancies were noted and, to create definitive boundaries, the code list was slightly adjusted and definitions clarified to ensure consensus for a final code list. Supported by the prolonged engagement with the data and convergence of the codes, the author identified four

distinct emergent themes of patterns and reoccurrences across multiple cases. Two other researchers were involved with the author in discussion and consensus building around the emergent themes.

Chapter 3

3 Results

The results section begins with an overview of characteristics of the primary and secondary participants, moving to a description of the eight investigated falls. Narrative summaries and case study conclusions for each case study follow. Next, an overview of the contributing factors is presented followed by presentation of emerging themes that resulted from content analysis.

3.1 Primary Participants' Characteristics

In total, eight individuals were recruited, but one person was immediately excluded from the study because she was not receiving daily assistance from a caregiver nor was she providing daily assistance to another person. The remaining seven individuals participated. All participants experienced a fall. One participant experienced two falls, and both were investigated as separate case studies, resulting in the total of eight case studies presented here.

Participants ranged in age from 83 to 90 years, with an average age of 86 years. Table 1 describes characteristics of primary study participants. Each primary participant has been given a pseudo name. Overall, all but one was female; one person had a moderate cognitive impairment; an average of seven medications was prescribed for each participant (range 3-11); the majority of individuals were not using a mobility aid; and only one participant was a caregiver. All were recipients of CCAC Homecare services in the past, but only one was receiving CCAC Homecare at the time of the fall. After their falls, three participants began receiving Homecare services. Two others received medical treatment for their falls but were not admitted to Homecare afterwards, and one person moved to LTC.

Table 1 Primary Participant Demographics for Falls Investigated With the SFIM

Name	Sex	Age	Marital status	Cognitive status	MMSE score/30	No. of meds	Equipment used at time of fall (usual mobility aid)	Formal homecare receiver			Informal care provided
								Prior to fall	At Time of fall	Post fall	
Mr. Dee	M	83	Married	Normal	25	3	None (walker and cane)	yes	yes	yes	By spouse
Mrs. Kay	F	86	Widowed	Mild impairment	N/A	7	None (rollator walker)	yes	no	yes	By daughter
Mrs. Bridge	F	90	Widowed	Moderate impairment	14	4	None	yes	no	no	By nephew and friends
Mrs. Broom	F	85	Married	Normal	30	6	None	yes	no	yes	To spouse
Mrs. Peters	F	88	Widowed	Normal	26	6	Bar height stool (cane)	yes	no	no	By daughter
Mrs. Rose	F	88	Widowed	Mild Impairment	23	11	Straight back chair (rollator walker)	yes	no	no	By son and two daughters
Mrs. Bee	F	84	Married	Normal	26	11	Transport wheelchair	yes	no	yes	By and for spouse (interdependent)

3.2 Secondary Participants' Characteristics

The secondary participants included family members, friends, and formal caregivers such as doctors, nurses, therapists, and CCAC case managers. Representatives of agencies that had specialized knowledge and expertise about contributing factors, such as Alzheimer Society, National Association for Home Builders, and public health nurse, were also involved. They were not familiar with the case study occurrence but were aware of policies and standard practices, such as recommendations for window blinds installation. Table 2 provides a summary of secondary participants for each case study and describes additional non-human data sources that were consulted for completion of the investigations.

Table 2 Summary of Secondary Participants and Description of Additional Data Sources for Eight Case Studies

Investigation	Secondary participants	Additional data sources
Mr. Dee ID*14801	Wife, nurse practitioner, family physician, physiotherapist	Canoe website ** for medication review
Mrs. Kay ¹ ID 15522	Daughter, nurse practitioner, pharmacist and pharmacist technician, certified window blind installer with 15 years of experience, CCAC hospital case manager (CM)	Primary care health record, two unrelated pharmacy technicians from one large and one small pharmacy
Mrs. Kay ² ID 15523	Daughter, nurse practitioner, PSW supervisor for this supportive housing building, occupational therapist, CCAC hospital CM	Primary care health record; aging-in-place design literature from Canada Mortgage and Housing Corporation, National Association for Home Builders and the Centre for Universal Design
Mrs. Bridge ID 15524	Nephew, family physician, friend, CCAC community CM, occupational therapist from 2010, Alzheimer Society counselor	Primary care health record
Mrs. Broom ID 15525	Spouse, daughter, occupational therapist, public health nurse overseeing falls prevention	Local hardware store survey of broom handle styles on the brooms available for sale, online broom handle style search
Mrs. Peters ID 16036	Daughter, certified age-in-place specialist, director of planning and municipal services, social housing administrator, building contractor/landlord, community nurse	Aging-in-place design literature from Canada Mortgage and Housing Corporation, National Association for Home Builders and the Centre for Universal Design
Mrs. Rose ID 16259	Daughter, son-in-law, PSW, family physician, occupational therapist, physical therapist	Therapy provider reports, primary care health records, CCAC referral for therapy
Mrs. Bee ID 16383	Husband, nurse practitioner, secretary from ophthalmologist office	Primary care health records, sales representative from local vendor for healthcare equipment, transport wheelchair manufacturer literature from AMG and Invacare

Notes: ¹ & ² indicate first and second adverse event for the same faller; * ID number provides a reference for the full case study report in Appendix K-R; ** Canoe website for medication review http://chealth.canoe.ca/drug_info.asp?relation_id=1196 was used for all investigations; CCAC is Community Care Access Centre; CM is case manager; AMG is a healthcare equipment manufacturer.

3.3 Characteristics of Falls Investigated

As previously indicated, all AEs investigated were falls; however one investigation also uncovered a medication error. The error came to light after the fall, and although examined within the context of the SFIM parameters, it was not the major trigger for the investigated fall. Half of the falls occurred in the morning. All happened indoors: four in the kitchen, two in the bedroom, one in the living room, and one at the front entrance of the home. Six of the falls resulted in a visit to the hospital, with two fallers being admitted for hospital stay. Two falls did not require medical attention and were divulged during a routine primary care visit. Table 3 describes in more detail all the investigated falls.

Table 3 Characteristics of Eight Investigated Falls and Their Consequences

Investigation	Age	Fall location	Time of fall	Medical attention received	Injury sustained	Living situation post fall
Mr. Dee ID 14801	83	Kitchen	14:00	Routine primary care visit	None	Remained at home
Mrs. Kay ¹ ID 15522	86	Living room	07:45	ER visit	Concussion	After ER visit returned home for one week
Mrs. Kay ² ID 15523	86	Bedroom	01:00	Admitted to hospital	Back and right leg pain; unable to stand	Over 2 months in the hospital; considering a return home with CCAC support
Mrs. Bridge ID 15524	90	Front entrance	10:00	Admit to hospital	Hip fracture	Admit to LTC
Mrs. Broom ID 15525	85	Kitchen	09:00	ER visit	Humerus fracture	Remained at home
Mrs. Peters ID 16036	88	Kitchen	18:45	ER visit	Staples for head wound	Remained at home
Mrs. Rose ID 16259	88	Bedroom	14:30	Routine primary care visit	Bruising	Remained at home
Mrs. Bee ID 16383	84	Kitchen	22:30	ER visit	Rib fracture	Remained at home

Note: ¹ & ² indicate first and second adverse event for the same faller

3.4 Narrative Case Summaries

In-depth, detailed documentation of the case is required for naturalistic generalization from the cases (Stake, 2005) and to allow readers to see the particularities of the cases and use these details as examples for forming solutions (Salminen et al., 2006). Due to length, full case reports generated by SFIM database are presented the appendices (Appendices K-R). The within case analysis summary of each case, describing the contributing factors and how they interconnected to result in the fall, are presented here.

3.4.1 Mr. Dee (ID 14801)

Mr. Dee, an 83 year old gentleman who lived with his wife in a small, compact home. He fell backward in his kitchen on December 23, 2011. In 2009, he had slipped on snow and fractured his left hip. He had a history of “blurred vision” when moving his head up and down, which he never mentioned to his wife.

On the day of the fall, while his wife was in the next room setting up Christmas decorations, he walked through the kitchen, without his cane or walker, to sit down at the table. Wanting to help his wife out, he stopped at the counter to stir up bread cubes that were drying for Christmas turkey stuffing. While completing the task, he moved his head up and down, and his vision became blurry. He stumbled backwards and landed on the ground. He was not injured. His wife heard the noise and came into the kitchen to assist him to stand up.

Using the Systemic Falls Investigative Method (SFIM), multiple contributing factors were identified, including deficiencies within all four levels of the Swiss Cheese Model of Accident Causation.

- Mr. Dee had a number of health related preconditions which contributed to the fall. They were a past left hip fracture, poor proprioception in his left foot, poor balance, as well as blurred vision associated with head movements and when standing up too fast.
- Mr. Dee’s actions and decisions also contributed to this fall. He ambulated within the small compact house without his rollator walker due to the constrained small spaces, he did not mention his episodes of blurred vision to his new doctor or his wife because the episodes were long standing, and he felt his compensation method of not

standing up too fast was sufficient. Also, he was multitasking, when he moved his head up and down while standing and stirring bread crumbs with both of his hands occupied.

- The compact, small home was unsuitable for an individual who requires constant use of a rollator walker. Mr. Dee did not use his walker inside the home, which increased his risk for falls.
- The wife was occupied in the living room and unable to redirect Mr. Dee from multitasking at the kitchen counter.
- Medical files were not freely shared when a patient transfers from one family physician to another. It is a common practice of doctors to charge patients to have their medical files transferred. This fee covers the administrative, copying and courier cost incurred by the physician and are not billable to the Ontario Ministry of Health. Mr. Dee declined to pay the \$70 transfer cost, and the new physician did not insist on having Mr. Dee's old medical record. To mitigate this situation, Mr. Dee's wife kept a record of his medical appointments, test results, diagnoses and medications.
- The wife's medical history of Mr. Dee was incomplete. Mrs. Dee was unaware that her thorough note keeping of medical tests and results was incomplete. The notes had nothing about episodes of faller's blurry vision.
- The new physician accepted the medical history kept by Mrs. Dee in lieu of a medical chart from the past physician. This information was assumed to be accurate in the absence of a full medical record. Ultimately, the new physician was unaware of the need to investigate physiological issues contributing to Mr. Dee's blurred vision.

Unsafe actions and decisions of Mr. Dee, his wife, and doctor combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.4.2 Mrs. Kay (ID 15522, 15523)

The name Mrs. Kay was used for both investigations of the same participant. The name Mrs. Kay¹ refers to findings from investigation of her first fall (ID15522), and the name Mrs. Kay²

refers to findings from investigation of her second fall (ID 15523). To avoid repetition of generic person-related information two investigations are combined.

Mrs. Kay, an 85 year old woman living alone in a rental apartment, fell backward at about 7:55 am on March 25, 2012. The building in which she lived was an apartment building designated as a supportive housing building by the Local Health Integration Network (LHIN). Mrs. Kay did not have a previous history of falls but did have a fear of falling. A widow, she relied on her family, particularly one daughter who lived close, to assist her with tasks around the apartment and to attend appointments with her. Mrs. Kay¹'s first fall occurred when she leaned to the right side to reach behind a lamp and access a cord that opens the vertical blinds. This was a task she usually completed from a sitting and not a standing position. When she straightened again, she stumbled backwards and fell, hitting her head on the coffee table. Mrs. Kay¹ called her grandson to help and was brought to ER and diagnosed with a mild concussion as a result of this fall.

Mrs. Kay²'s second fall was just after midnight on April 1, 2012. On the night of this fall, Mrs. Kay² was hot, so she got out of bed to open the bedroom window and cool the bedroom. She reached to the right and up over shoulder level, lost her balance, and fell to the left side. She was unable to get up on her own and she pressed Lifeline. Her daughter and son-in-law came to assist. Mrs. Kay² had difficulty standing and was unable to walk even with help. Daughter called an ambulance and Mrs. Kay² was admitted to the hospital for further investigation.

Using the Systemic Falls Investigative Method (SFIM), multiple contributing factors were identified for both falls, and they included safety deficiencies within all four levels of the Swiss Cheese Model of Accident Causation.

- Mrs. Kay had a number of health related preconditions that contributed to the falls. She was deconditioned; she had decreased strength in her right shoulder; and her right knee had buckled in the past and was unreliable for weight bearing. She had poor balance and a fear of falling. She showed minor cognitive changes affecting her ability to learn new tasks and was apprehensive in new situations. She was also taking an extra dose of Avapro®, a blood pressure medication (150 mg dose in addition to

the original 300mg dose). On March 27th the mistake was discovered by her nurse practitioner and the dose was reduced to 300mg.

- Mrs. Kay's actions and decisions also contributed to her falls: (1) Due to sentimental attachment, Mrs. Kay¹ and her family decided to retain extra living room furniture when she downsized from house to an apartment; (2) Due to apprehensiveness in a new environment, she decreased her activity level after moving to an apartment in June 2011; (3) After a one week stay in the hospital, precipitated by a bladder infection, she declined Community Care Access Centre (CCAC) services offered to her at time of discharge in September 2011; (4) On the day of the first fall, she awkwardly leaned over to the right and over-reached behind a lamp to pull open vertical blinds; (5) . On the day of the second fall, she over-reached up and to the side with both arms to pull a window open.
- The physical environments also contributed to her falls: (1) The vertical blinds, which were left in place by the previous tenants, had the pull cord positioned at the end away from where the door opened, behind a lamp; (2) The bedroom windows height was 48 inches from floor to the window sill and another 12 inches to the latch and pull handle. The latches required both hands to pull the window open, one to hold the latch down and the other to pull on the window; (3) The apartments did not have individual thermostats, requiring Mrs. Kay² to regulate room temperature by opening and closing the windows. Many other seniors in the same building relied on the assistance of personal support workers (PSWs) or family caregivers to open and close the bedroom windows.
- The daughter, her primary care giver, had less time to effectively reassure Mrs. Kay in her new residence in the summer of 2011. The daughter's husband was ill and her own daughter was getting married. Other family members lived out of town or worked full-time, limiting opportunities for visiting and encouraging Mrs. Kay to increase her activity level. Also the summer was very hot, limiting outdoor mobility. Mrs. Kay was reluctant to venture out on her own and became deconditioned.
- The CCAC was in contact with Mrs. Kay in September 2011 during a hospital admission. Mrs. Kay declined CCAC services because she decided to stay with her daughter upon discharge, so the CCAC did not open a file after a bedside

consultation. CCAC's standard practice is not to follow-up with an individual when services are declined since they are busy managing active cases. However, the CCAC does have a "case management only" status, which allows for follow-up of an individual for up-to three months when initially no services are put into place, but this status is rarely used.

- CCAC lacked a policy to follow-up with patients who declined services post-hospital discharge to ensure the patient's safety needs were met. Expectation of the hospital CCAC case manager (CM) was that the patient will recall information given at the time of discharge. Mrs. Kay was overwhelmed with information received close to discharge, and she did not recall the CCAC information when she returned home after her one month stay with family, when she stated she was experiencing difficulty with standing transfers.
- Family addressed Mrs. Kay's decrease in strength by purchasing a lift chair in October 2011. The daughter and Mrs. Kay did not consider physical therapy or volunteer run senior exercise group available in the neighborhood to ameliorate physical deterioration. The lift chair compensated for the weakness and difficulty with standing transfers but contributed to Mrs. Kay's further decline of strength.
- Family assumed they had all necessary information on vertical blinds. The vertical blinds' pull cord was positioned at the side of the window blocked by a side table and lamp when Mrs. Kay¹ moved into the apartment in June 2011. The family chose to keep the pull cord's position, assuming that if the position was changed the blinds would gather in front of the patio door and become a hazard. The family was unaware of the option of changing the pull cord direction without changing position of the blinds. The manufacturer instructions for the vertical blinds were not available from the previous tenant, but, unknown to the family directions for changing the cord position were available online.
- Family yielded to Mrs. Kay¹'s desire to retain her possessions from her previous home. Extra furniture limited Mrs. Kay¹'s access to the pull cord for the vertical blinds that was left in place from the previous tenant.
- The pharmacy's policy was to give only verbal instructions for a medication change. The pharmacy assumed the doctor had discussed and ensured Mrs. Kay¹ understood

the medication change. Mrs. Kay¹'s daughter did not recall receiving the verbal instructions from the pharmacist or from the prescribing doctor for Mrs. Kay¹ to stop the one dosage of Avapro before beginning the new dose. Mrs. Kay¹ was unaware she should stop the initial dose of Avapro and ended up taking an extra dose (300 mg plus 150 mg) of this blood pressure medication starting on March 19, 2012. This could have affected her blood pressure when she was standing and reaching.

- The Local Health Integration Network (LHIN) gave the distinction of “supportive housing building” to the building where Mrs. Kay² lived based on the large number of seniors who were already living there. The supportive housing program allowed for greater number of funded services to eligible seniors. Mrs. Kay² specifically moved to this building because of the building’s supportive housing designation. However, the building had some features that were unsatisfactory for the needs of seniors, such as high windows, narrow bathroom door, baseboard heater in front of patio door, etc.
- The CCAC intake case manager, who works in-office taking information regarding incoming referrals, delayed putting PSW assistance in place after Mrs. Kay²'s two fall incidents earlier in the week, even though the daughter had reported to the intake CM that her mother required assistance and was at risk for more falls. Some intake CM's practice was to delay PSW initiation until the OT and the community CM completed assessments to confirm what level of assistance was required.

Unsafe actions and decisions of Mrs. Kay, her family, her pharmacist, the CCAC, and the LHIN combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.4.3 Mrs. Bridge (ID 15524)

Mrs. Bridge, a 90 year old lady, lived alone in her own home. She was a very independent, active, “on the go” lady. She played bridge weekly with a consistent group of friends and was a member of a local service club. Seven weeks prior to her fall, Mrs. Bridge had her remaining five teeth extracted, so her dental plate no longer fit. Her nephew visited twice a day to ensure she had soft meals and to see that she was well. On March 28, 2012, at 10:00 am, Mrs. Bridge fell inside the front door of her home and fractured her right hip. Her nephew found her when he went to pick her up for a dental appointment. She reported that

she had gone outside to check her flowers and fell when she re-entered. The inner front door was closed, and judging from the direction of landing, it was likely that she stumbled after turning to close the door.

Using the Systemic Falls Investigative Method (SFIM), multiple contributing factors were identified, including deficiencies within all four levels of the Swiss Cheese Model of Accident Causation.

- Mrs. Bridge had a number of health related preconditions that contributed to the fall. They were: history of falls, poor balance, and decreased cognition (14/30 on the MMSE post fall).
- Mrs. Bridge's actions and decisions also contributed: she inconsistently visited her doctor, frequently skipped taking prescribed medication, declined medical advice, declined installation of Lifeline®, and discontinued daily CCAC support services. She historically had a laissez faire attitude to life, an independent (reportedly stubborn) personality, and persuasive verbal skills.
- Family supervision was not available to monitor Mrs. Bridge's actions and compliance with medical advice prior to 2011. She was widowed and had no children. She attended medical appointments alone, and there were no informal caregivers to monitor adherence to medical advice. When her nephew began to visit weekly in 2011, he provided transportation only and did not want to be "snoopy" regarding his aunt's affairs.
- Mrs. Bridge's friends felt that they did not have the authority to intervene with her choices. Mrs. Bridge was able to "fool" those around her to hide her cognitive weaknesses. When the friends noticed an increase in Mrs. Bridge's disheveled appearance and inappropriate actions, such as taking moldy cheese to a social event, they felt helpless. Friends were unaware that community agencies such as the Alzheimer Society could provide suggestions on how to support a person with any type of cognitive decline.
- PSW visit times were inconsistent and did not always meet Mrs. Bridge's needs or preferences. Timing of CCAC PSW visits reportedly interfered with Mrs. Bridge's routine, leading to discontinuation of service. CCAC was only able to keep a file open to monitor a client for three months, at which time, if no services were introduced, the

case manager must close the file. In 2010, Mrs. Bridge gave the false impression that she was managing well with the supports from her friends. The CCAC file was closed and not reopened. When CCAC services were discontinued, the only formal way of monitoring her cognitive decline and high fall risk was lost.

- Mrs. Bridge's doctor was unaware that CCAC services were discontinued and did not know about any safety concerns the CCAC service personnel may have had when the file was closed. The CCAC does not send a discharge report to the primary care physician when services are discontinued.
- The family physician lacked a method to trigger a recall visit to reassess a patient with consistent but slow cognitive decline or a history of falls, although such follow-up visits are standard practice for individuals with diabetes.
- Neither the CCAC CM nor the family physician formally questioned Mrs. Bridge's capacity to make her own decisions. Their standard practice was to err on the side of caution when cognitive capacity was in question, to preserve an individual's rights. A capable person is entitled to make choices that may not appear to be the best choice in the opinion of others. Mrs. Bridge's capacity to make decisions had not been formally assessed by a capacity assessor. A capacity assessor can be any health care professional who has been trained through the Ministry of the Attorney General to determine whether an individual is mentally capable of certain types of decision-making. The family doctor rarely requested that a patient have a capacity assessment completed. The regular practice was to wait until an individual is admitted to the hospital and have the hospital healthcare team deem an individual unsuitable for return home due to cognitive impairment.
- There was a lack of communication between doctor, nephew, friends, and CCAC. This enabled Mrs. Bridge's cognitive decline to continue unaddressed.

Unsafe actions and decisions of Mrs. Bridge, her nephew, her friends, the CCAC, and doctor combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.4.4 Mrs. Broom (ID 15525)

Mrs. Broom, an 85 year old lady, fell on February 24, 2012, inside the home she shared with her husband. She fell forward, landed on her right arm, and fractured her humerus. Mrs. Broom was responsible for all the meals and household chores for herself and her husband. On the day of the fall, she tripped over a broom handle as it slipped along a kitchen counter to the floor in front of her. In the rush to get things done on the morning of the fall, she had intentionally left the broom leaning on the kitchen counter. Mrs. Broom was aware the broom position was unsafe, as the broom had slid and fallen to the floor in the past. After the fall she required medical attention at the emergency department of the hospital.

Using the Systemic Falls Investigative Method (SFIM), multiple contributing factors were identified, including deficiencies within all four levels of the Swiss Cheese Model of Accident Causation.

- Mrs. Broom had a number of health related preconditions which contributed to the fall. They were: history of one previous fall, history of arthritis, right hip replacement in 2008, arthritis in left hip, and a decreased reaction time related to age and reduced activity level.
- Mrs. Broom's actions and decisions also contributed: rushing while multitasking and leaving a broom that had a history of sliding down leaned against the counter.
- Fall prevention education programs provided by the local Health Unit were not reaching seniors in the community or influencing change in their unsafe behaviours. A formal, public fall prevention session has not been offered in this small town by the Public Health Unit since 2006. The Health Unit changed focus from formal workshops on falls prevention to printed media messages to educate seniors about fall prevention. Mrs. Broom had never seen these media messages, although she regularly reads local newspapers.
- Fall prevention education from OT was not memorable for Mrs. Broom. She did not recall safety suggestions provided by OT at the time of hip surgery in 2008, or even after this most recent fall. Mrs. Broom has no recollection of being formally educated on fall prevention strategies, though the CCAC had put therapy services into place both times to assure safety in her home.

- Brooms similar to the one Mrs. Broom used were manufactured with handles that do not have a non-slip surface to prevent sliding when leaned against a counter. Most brooms have varnished or PVC coated handles, which are smooth, allowing the handle to slide when placed against a counter. There were no brooms with non-slip handles available for purchase in the local stores.
- Daughter, after sitting in on therapy session, was unable to convince Mrs. Broom to incorporate more fall prevention strategies into her daily activities, such as wall mounted grab bars in the bathroom and gate in front of open stairway. Mrs. Broom felt that recommended changes did not apply to her and her current functional status. Mrs. Broom was a competent adult; her daughter was unable to enforce her suggestions.

Unsafe actions and decisions of Mrs. Broom combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.4.5 Mrs. Peters (ID 16036)

Mrs. Peters, an 88 year old lady, fell on April 30, 2012 at 6:45 pm while reaching low into a deep corner cupboard for an infrequently used bowl. Mrs. Peters had made some strawberry sauce that evening and wanted to put it away. She needed to access a bowl stored in the back of a difficult to reach, lower, deep corner cupboard. She leaned over, supporting herself on a tall stool, and reached to the back of the cupboard for the large bowl. She placed the bowl on the counter, but before she was able to stand again, the stool tipped sideways, and she fell over backwards. Mrs. Peters moved into this newly built apartment building, dedicated for low-income seniors and persons with a disability, in April 2011, a year before the fall.

Using the Systemic Falls Investigative Method (SFIM), multiple contributing factors were identified, including deficiencies within all four levels of the Swiss Cheese Model of Accident Causation.

- Mrs. Peters had a number of health related preconditions that contributed to the fall. They were: a past fall in the bathroom of her previous residence, blood pressure medication, and poor balance.
- Mrs. Peters' actions and decisions also contributed: multitasking while leaning on a stool and reaching forward into a deep cupboard.
- Family assisted Mrs. Peters to store some kitchen items in a difficult to reach, low, deep corner cabinet when she moved into the apartment. Family was aware of the awkward design of this kitchen cabinet, and assisted Mrs. Peters to store less frequently used items there. The kitchen design was such that easily accessible storage space between shoulder and waist height was not available. Mrs. Peters had no option but to store items that required occasional access in a difficult to reach area.
- Age-in-place design features were not implemented in the units geared to seniors in this newly built apartment building, although the checklists with age-in-place design recommendations was readily available on-line.
- The County housing authority's procedure for awarding a \$1.7 million contract for construction of this senior friendly building did not include requirements for age-in-place design features.
- Both the contractor and the County housing authority were unfamiliar with age-in-place design features.
- Ontario building code also does not include age-in-place design considerations. Wheelchair accessibility design features and universal design guidelines are integrated into the Ontario building code, but specific age-in-place designs are not mandatory.

Unsafe actions and decisions of Mrs. Peters, family, County housing authority and builder combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.4.6 Mrs. Rose (ID 16259)

Mrs. Rose, an 88 year old lady, fell inside her home on the afternoon of May 10, 2012 while reaching for a container of TUMS®. She had recently returned home from the adult day program, and her stomach was upset. She walked to the bedroom, where she leaned on the

back of a chair with her left hand as she reached forward with her right hand to a narrow shelving unit in the corner. As she grasped the container of TUMS®, she straightened, lost her balance and fell backward to the left side, pulling the chair with her. She was able to use her Lifeline® service and obtain assistance from her family, who lived across the road, to get up from the fall. Medical attention was not required after the fall.

- This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation. Mrs. Rose had a number of health related preconditions which contributed to the fall. They were: arthritis, decrease range of motion in her right shoulder, decreased endurance, poor balance which noticeably worsened when Mrs. Rose was fatigued, 11 prescription medications, re-occurring upset stomach, a previous stroke with residual left side weakness and decreased coordination (Dec 31, 2012), and history of frequent bladder infections and cellulitis.
- The following Mrs. Rose's actions and decisions contributed: she did not follow up with home exercise routines, she stored the frequently used TUMS® in a difficult to reach location, she 'fired' her daily PSW support and declined follow up attempts by the occupational therapist from CCAC.
- The initial OT services offered by the CCAC after Mrs. Rose's stroke focused on equipment needs and mobility safety within the home. The OT only completed initial assessment and there were no follow-up visits. The location of frequently used items, such as her TUMS®, was not discussed. Attempts for further follow-up from this OT were declined by the Mrs. Rose. She was overwhelmed by the number of different support workers and therapists coming into her home.
- Multiple PSWs were assigned to care for Mrs. Rose. Daily PSW visits were difficult to cover with a consistent time and staff member. New clients who require daily visits were scheduled within existing time schedules of PSWs. If additional PSWs were recruited to cover the 'ideal' morning preparation hours (7-9 am), there would be fewer hours of work for each PSW. The PSWs who want eight hours of pay per day have to work approximately 12 hours a day to offset the time lost between

appointments. PSW visitation hours are controlled by the agency's schedulers who are not familiar with the preferences of clients receiving service.

- PSW visit times to Mrs. Rose's home varied each day. Mrs. Rose was asked not to dress until the PSW arrives to assist her with the bath. Mrs. Rose did not like waiting in her night gown for the PSW to arrive, which would be sometimes in late morning and sometimes not at all.
- Family left TUMS® at the same location where Mrs. Rose had them prior to the stroke. The family was unaware of the difficulty Mrs. Rose had in accessing TUMS®. The family members came in twice a day, or more if needed, to assist Mrs. Rose with other activities such as glucose check, insulin shot, meals, and letting out the dog. Any difficulties with daily tasks were addressed as they arose, such as moving the microwave to another location for easier access and the eventual relocation of TUMS® to the kitchen.
- There was a lack of caregiver assistance after the adult day program, when Mrs. Rose was fatigued. The staff transporting Mrs. Rose home ensured she entered the home safely but did not assist with in-home tasks.

Unsafe actions and decisions of Mrs. Rose, family, occupational therapist, agency providing PSW services, and CCAC combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.4.7 Mrs. Bee (ID 16383)

Mrs. Bee, an 84 year old living with her husband, fell forward while walking to the kitchen and holding onto her wheelchair at 22:30 on May 24, 2012. Mrs. Bee had had cataract surgery the week before her fall that caused extra stress on her husband and herself. The couple had been interdependent on one another, and the eye surgery caused increase in Mrs. Bee's dependence on the husband, who also had multiple health issues. On the night of the fall, Mrs. Bee felt guilty, and although tired, she wanted to help her husband in the kitchen before going to bed. She tripped on her feet while walking and holding onto AMG Airgo® transport wheelchair. The transport wheelchair moved too far ahead, and she fell forward. Later the same night, the husband took her to the emergency department, because Mrs. Bee was unable to transfer out of her bed due to severe pain in her side.

Using the Systemic Falls Investigative Method (SFIM), multiple contributing factors were identified, including deficiencies within all four levels of the Swiss Cheese Model of Accident Causation.

- Mrs. Bee had a number of health related preconditions which contributed to the fall. They were: macular degeneration in addition to the recent cataract surgery; a fall three years ago which resulted in fractured vertebrae and back pain that caused muscle spasms when her activity level was too high; poor mobility, and decreased strength. On the night of the fall Mrs. Bee was tired and irritable.
- Mrs. Bee's actions and decisions also contributed: she ambulated around the house holding a transport wheelchair; she discontinued her physical therapy exercises; she decided to not follow up with a referral to a pain management clinic; and after her cataract surgery she carried on with most daily activities without asking for increased assistance from other her children, friends, or the Community Care Access Centre.
- Family physician and ophthalmologist assumed that Mrs. Bee will be able to manage daily activities after her cataract surgery with her current level of support. Options for in-home help to decrease the burden on Mrs. Bee and her elderly husband after surgery were not reviewed. Mrs. Bee was of the understanding that being extra cautious after her eye surgery would be enough to keep her safe. The elderly couple was interdependent on each other for daily functioning, and the couple's strategy for completing tasks together was disrupted after Mrs. Bee's reduced ability to contribute post eye surgery.
- Standard practice for post cataract surgery home support services was that CCAC does not get involved as long as the operated individual was physically capable of administering the post-surgery eye drops. In addition, CCAC services were mandated only for personal care assistance, such as bathing. Although Mrs. Bee's husband was able to assist with administration of eye drops, his own health issues prevented his greater involvement in everyday household activities. After a week of administering eye drops four times a day, in addition to the regular household tasks, he reached his limit. The couple became stressed and irritable with each other, which increased Mrs. Bee's fall risk because she attempted to perform activities when fatigued and beyond her limits.

- Her son and daughter continued with original level of support for this inter-dependent couple; son visited as needed to help with home maintenance issues, and daughter came biweekly to clean the home. After the cataract surgery the co-dependent balance changed for Mr. and Mrs. Bee, but their increased need for assistance was not communicated to their social network. This lack of support increased the stressors leading to the fall.
- Mrs. Bee chose to use a transport wheelchair for mobility inside the house since it allowed her to sit and foot propel herself around the home when her back ached. She did not want to have a walker in addition to this wheelchair. She was concerned about increasing her fall risk due to too many pieces of equipment to potential to trip on them with her decreased vision. She was unaware of another possible mobility aid; namely walker-transport wheelchair combo, which combines the features of the transport wheelchair (safely seated while moving) with rollator walker features (brake levers at the handles to use when walking with the aid). Health care equipment vendors rarely marketed the walker-transport wheelchair at senior events, as they perceived this mobility aid to be a specialty item, requested by therapists for clients. However, the walker-transport wheelchair combo was a good and safe alternative for seniors like Mrs. Bee.
- As with most assistive devices obtained second hand, a user manual did not accompany the transport wheelchair when Mrs. Bee got it from a family member. The original instructions for the transport wheelchair instructed the user to have assistance of another person to apply brakes before transfers and to not use the chair as a rollator walker, which is what Mrs. Bee did. When instructions do not accompany an assistive device, the risk of inappropriate use of that device increases creating an added safety risk.
- Transport wheelchairs lack permanent safety labels. The transport wheelchair manufacturer did supply a safety instructions page with new transport wheelchairs but not a permanent safety label attached on the assistive device.

Unsafe actions and decisions of Mrs. Bee, family, and doctors combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event.

3.5 Identified Contributing Factors

The SFIM investigations revealed numerous contributing factors for each AE. The contributing factors were temporally linked and successive, leading from one into another and involved factors at each of four levels of the Swiss Cheese Model of Accident Causation. The Sequence of Events (SOE) diagrams, included in each case study report (Appendices K-R), established the timeline of the events that led up to the impact and linked the contributing factors (ovals) to each safety significant event (bolded rectangles). The Swiss Cheese Model of Accident Causation summary table is also included in case study report for each investigation (Appendices K-R). It specifies the layer of defense (unsafe acts and decisions, preconditions, supervision, and organizational level) for each contributing factor.

An average of 35 (range of 22-47) contributing factors (CFs) was identified in each case study. A total of 280 factors were found over the eight cases. Most of the factors were preconditions, average 15 (total 120, range 9-23); followed by Acts and Decisions, average 10 (total 76, range 7-12); Supervision, average 7 (total 58, range 2-13); and Organizational Factors, average 5 (total 40, range 2-9). When all repetitions were eliminated, there were a total of 247 unique factors; 68 Acts and Decisions, 101 preconditions, 41 Supervision, and 37 Organizational. The eight Swiss Cheese tables of contributing factors were used in content analysis for identification of between-cases similarities.

3.6 Content Analysis Results

In this section the researcher first reflects on the process of establishing codes of patterns and similarities, followed by a summary of the four emerging themes associated with safety of care- dependent community dwelling older adults.

3.6.1 Coding List Formation

The first step of coding list formation was completed independently by three researchers (DG, AZ, and AS) on the full data set (DG and AZ) or half the data set (AS) and it produced 15 main codes. Seven were stand-alone codes and eight were further divided into 2-5 sub-codes. Once the independent lists of draft codes were consolidated, the research team met to

discuss discrepancies and come to consensus on unresolved issues. The second round of coding was completed by two researchers (DG and AZ) on the full dataset and produced only minor discrepancies, primarily related to some the sub-codes. Six codes required consolidation with other codes to tighten up and create definitive boundaries between the codes. The list was shortened to 10 main codes, seven of which had 2-4 sub-codes (Appendix S). Every contributing factor was coded into one of the generated codes. The code “other” included only three of the 280 contributing factors

3.6.2 Overarching Themes

Through inductive analysis of the coded dataset, four main themes emerged to complete the puzzle of safety breakdowns for care-dependent older adults and their caregivers who age in place. These themes relate not only to the ‘what’, but in using a systemic investigation method, the ‘how’ and ‘why’ of each event are also discovered. Each of the codes from the analysis process contributed a piece of the puzzle, demonstrating how for these seven individuals the defense layers described by the Swiss Cheese Accident Causation Model did not provide sufficient protection. There were holes in the defense layers. Safety was compromised and resulted in an AE. The four themes that emerged from these codes relate to the safety breakdowns that occur while aging-in-place, and will need to be ameliorated for society to find solutions to these breakdowns. The themes are:

- Everyday living has become risky,
- Limitations with supervision,
- Disconnects within the system, and
- Poor safety risk identification and follow-up.

3.6.2.1 Everyday Living has Become Risky

Care-dependent older persons aging in place and their caregivers were performing ordinary, routine everyday activities, such as stirring up the stuffing, opening window blinds, opening bedroom window, entering the home, cleaning the house, pulling out a bowl from a cupboard, picking up TUMS, or helping to put leftovers away after dinner, at the time of the fall. However, these mundane activities became risky because they combined with personal factors, such as impaired body functions that resulted in poor balance, poor endurance, poor

reaction times, decrease range of motion, or decreased vision. The ordinary activities also combined with individuals' personalities, such as fearfulness, determination to be very independent, laissez faire attitude, anxiety, and stress. The normal activities have also become risky due to polypharmacy and medication errors, fixed designs of physical environments, and the natural world environment, where examples include: limited space to operate assistive devices in home, high windows, hard to access storage space, a cloudy day, and a hot summer. Several product designs used by the fallers added to normal functioning becoming more risky, such as slippery broom handle, a stool that easily tips over, or a transport wheelchair that is mistakenly used as a walker.

In an attempt to do their best to meet challenges of aging-in-place, older adults frequently made maladaptive choices. Some had an overpowering desire to stay independent, while others refused to acknowledge functional changes that were occurring in their aging bodies. Examples here include retaining extra furniture after a move into a smaller apartment, laughing off concerns pointed out by friends, rejecting safety suggestion made by family for improvement of the home environment, continuing with activities even when fatigued, and putting up with debilitating pain. Everyday living also became risky when the faller refused help from others and accepted the risk of a potential fall or injury or judged that the risk was worthwhile to accommodate his/her personal preferences, such as declining to pay for medical file transfer, discontinuing CCAC services, avoiding to see a doctor, not following-up with medical recommendations, and discontinuing home PT exercises. Occasionally, due to lack of knowledge or incorrect information, the fallers perceived their situation as unchangeable and were doing their best to compromise, accommodate and compensate. Examples here include 'furniture walking' in a home too small to easily accommodate a walker, reaching into a low cupboard while leaning on a stool because of a lack of storage space at a suitable height, using a transport wheelchair because it offers a place to sit and foot propel when back pain increases, declining a pain clinic appointment because of a lengthy application and long drive to the clinic. At times fallers, their caregivers, policy makers, designers, builders, and others involved made a maladaptive choice without realizing that long term consequences of their choice could be unsafe. Some examples of individuals who had the full intention of doing the right thing, and were unaware of the potentially risky consequences, are: compensating for blurred vision by slowing down, declining CCAC home

support service at time of hospital discharge, introducing an electric lift chair to help with sit-to-stand transfers, prescribing a new dose of medication, or designing a kitchen with a difficult to reach cupboard. It was the combination of personal factors, environmental factors, and maladaptive choices that contributed to increased safety risk of ordinary everyday tasks for care dependent older persons and their caregivers.

3.6.2.2 Limitations With Supervision

Limitations in supervision, from both informal and formal care providers, increased the safety risk for older persons and the potential for occurrence of AEs. Limitations of informal caregiver's availability contributed to many of the investigated falls. Some older persons had no children or spouse to consistently monitor their functional and cognitive decline or question their safety choices. When children or siblings were present, they did not always have the time to assist as often as needed due to their own family and work commitments, such as an ill husband, a daughter getting married, or full time work. Some family members lived out of the area and, although willing to assist, were not consistently accessible for provision of care. For the co-dependent couple, the partner had his own health issues affecting his functional abilities, creating an interdependency balance that was tipped unfavourably when something new, such as cataract surgery, occurred.

Supervision limitations of formal caregivers were related to the workload and scheduling realities of formal caregivers. CCAC case managers' schedules did not allow follow-up on patients who declined services at the time of hospital discharge. PSW scheduling policies prevented consistent timing of PSW visits, leading to strained relationships with the care recipient and cancelations of services by the care recipient.

Supervision supports were also found to be ineffectual for decreasing the risk of an AE. Both formal and informal caregivers yielded to the older person's choices to avoid being paternalistic or when unable to persuade the older individual to accept a safer alternative. This is well described in the words of one son-in-law caregiver, who was concerned about a perceived push to have his mother-in-law (who fired all her PSW support services) admitted to LTC because of past falls:

“I don’t know if there is any real way you could prevent or improve [safety for community seniors][...] because there is still an independent minded person...it is just something that’s going to happen. You can’t rubber pad all the walls and all the furniture you know...you have to be careful, when you start thinking of ways to help them [independent older adults] because sometimes you take away their independence and that makes them more resistive and makes them angry [...] so if you can help them to keep some of their independence, that’s what we need to be doing...I don’t blame them one bit [for taking risks, firing workers, trying to keep control].” (Mrs. Rose’s son-in-law)

Those supervising older adults frequently tried to help the elder maintain some independence, even if that meant accepting greater risk. Other examples of ineffectual formal and informal supervision and yielding to an older adult’s preference included: a physician accepting the new elderly patient without a medical file transfer, family yielding to the elder’s desire to keep extra furniture that was cluttering the new apartment, friends not intervening when they witnessed bizarre behavior from an elderly person slipping into cognitive decline, CCAC manager erring on the side of caution when cognitive capacity of a client was questioned, family/doctor/ therapist being unable to convince the faller or enforce faller’s compliance with healthcare recommendations. Many of the caregivers were willing to accept a certain level of risk in order to help the older person achieve the goal of aging-in-place, but this yielding also increased the likelihood of an AE occurrence.

3.6.2.3 Disconnects Within the System

Disconnects between older persons and their support systems, as well as disconnects between the different members of the support systems, contributed to the investigated falls.

Incomplete, lacking or inadequate communication was a powerful factor that contributed to disconnect in the support system. Communication was incomplete when there was an unrealistic expectation to recall instructions, which led to poor follow-up by the participant or caregiver. For example, only verbal instructions were given by the doctor to the older adult and by the pharmacist to the caregiver without written reminders; instructions to contact the CCAC if the elder’s care needs change were given at the time of hospital discharge when older adults are overwhelmed with the amount of instructions they receive; occupational

therapist reviewed fall prevention tips with the older adult one time, on the day of initial assessment, and were not reviewed further.

Communication was lacking when information was not available, when it was not transferred from one health care provider to another, when it was not quickly accessible, or simply was not passed on by the older adult. Poor care transitions and poor discharge plans also lead to poor communication. Examples from investigated case studies include: changes in health status were not communicated by the older adult to his caregivers because he assumed that what he felt was normal; medical file from previous physician was not transferred to the new physician, limiting to the knowledge about the past medical history; access to electronic record of current medications was unavailable; instructions on how to use newly prescribed medication was not conveyed to the older adult by her caregiver; family doctor was not informed that CCAC discharged a patient at high safety risk; a patient with potential for continued deterioration and increased fall risk was discharged from the hospital without a plan for follow-up by the formal healthcare system.

Poor communication about available resources from support agencies resulted in misinformation and lack of awareness. Examples include: benefits of pain clinic were not explained or evident to the older person when she received the lengthy referral application in the mail, media messages on fall prevention in the local newspaper initiated by the local Health Unit were not noticed by the older adult who read the paper daily, community services for supporting individuals with declining cognitive abilities were unknown to faller's friends, benefits of exercise programs for maintenance of physical abilities were not evident to some of the older adults or their caregivers.

The last systemic disconnect identified was that home services, which were meant to improve the older person's life, ended up disrupting his/her life. The lack of flexibility and rigidity in provision of support from the CCAC resulted in rejection of the services that did not match the lifestyle and needs of the older care recipient. In one case, a client was not allowed to dress until PSW arrived to provide care. However, the PSW's arrival time was inconsistent and spanned between 8 – 11 am. After spending several mornings in a nightgown waiting to start her day until 11 am, the care recipient refused further service and had her family come daily. The PSW services were strictly guided by a CCAC care plan that

did not accommodate for client's personal schedule or preference. In addition, an atmosphere of reprimand kept care recipients compliant and quiet. For example, if the PSW was scheduled to give a bath on a certain day, the older adult felt obliged to have the bath, even if the bath was not wanted, because the care recipient was under the perception that the PSW services would be cut off if he/she did not follow the prescribed plan.

These system-wide disconnects were directly linked to the contributing factors in investigated AEs. In the words of Mrs. Bee, whose fractured rib was initially missed during her ER visit and who had to make multiple calls to the CCAC to receive much needed PSW support twice a day:

“My own experience right now is that somehow the client gets lost in the shuffle and it wasn't meant to be that way, and no one person is doing that. It's just we haven't got a system smooth enough [...] I was not impressed with what was happening to me [...]. I know they [the CCAC/LHIN] are going through struggles and a lot of changes, but because of that and trying to follow the rules, people [care recipients] are getting lost a little bit...and that's when the health care system gets costly, because it shouldn't have happened in the first place.” (Mrs. Bee)

“People are getting lost a little bit...” does not just apply to care-dependent older adults who get ‘lost’ in the system's service cracks, but disconnects in the system also mean that family members, friends, agencies, health organizations, and policy makers who support and cater to older adults get ‘lost a little bit’ too.

3.6.2.4 Poor Safety Risk Identification and Follow-Up

The inability of the larger societal system, health care system, as well as family and friends to recognize safety risks for older adults, or to correctly manage known safety risks, contributed to falls for the participants in this study. Inadequate policies for assurance of the safety of older persons, minimal involvement from support systems, and changeable physical environmental factors that do not meet the needs of the older person all relate to this theme of poor safety risk identification and follow-up.

Society seems to have a laissez faire attitude towards the safety of older persons living independently in community. An example of this casual approach was the lack of adequate policies for supportive housing, which is predominantly utilized by the elderly, resulting in apartments that had design features that do not match the abilities of older adults with health issues. This study uncovered that an older building located in a naturally occurring retirement community and designated for supportive housing: 1. had high windows with latches that were very difficult for an elderly person to open; 2. did not have independent thermostat to regulate bedroom temperature thereby requiring the elderly resident to open a window when room was too hot; 3. had narrow bathroom doors that did not allow an average width rollator walker to fit through; and 4. had a baseboard heater that created a high step between living room and the balcony.

Housing architecture and interior design problems were not exclusive to older buildings but occurred in the newly built apartment buildings too. Insufficient building codes for publicly funded housing designated for older adults resulted in a newly built apartment building with design features that did not meet the long-term needs of senior residents who want to age-in-place. For example: windows latches were too high, storage space options in the kitchen were either too high or too low, and fiberglass tub surrounds lacked pre-installed grab bars. The local housing authority and the builder were both satisfied that the building met the building codes, and it did. The building was fully accessible, and the ground floor apartment units, dedicated to persons with disabilities, were fully wheelchair accessible. However, the housing authority and builder did not consider specific needs of older adults, which are different from the needs of persons with disabilities or needs of the general adult population. They were unaware that casement windows are easier to manage because these windows have a crank handle for opening that is positioned low; a pantry cupboard for kitchen storage is a more accessible option; and grab bars pre-installed in the bathroom would have safety benefits for all the older residents.

Other examples of how formal societal support system failed to recognize and safely manage safety risks for an older person were: a lack of a policy and procedure to allow the family doctor to monitor an individual who did not have close family but was experiencing considerable cognitive decline; the common practice of renewing prescription medications

over the phone with the pharmacist for extended periods of time; and the practice of waiting for an individual to be hospitalized to assess her cognitive capacity rather than contesting it while she is living in community. Three other interesting examples of systemic issues that lead to increased safety risks are: the practice of doctors' offices to charge the patient \$70 for medical file transfer from one physician to another which, if patient refuses to pay, means that new physician will not have a complete health history; the lack of permanently attached safety instructions to follow along with donated assistive devices and home health equipment; and lack of training opportunities on how to use donated assistive devices.

In some case studies, marginal involvement of formal support systems contributed to poor risk identification and management. This occurred in situations when only basic requirements were completed by formal as well as informal supports, and more critical evaluation of an older person's situation was overlooked. Examples include: pharmacist assumed that the doctor explained a medication change (e.g., stop old dosage and start new dosage of the same medication) to the patient and filled a prescription without clarifying with the doctor; a family member avoided getting involved in the caregiving of his aunt out of fear that he might be perceived as "snoopy", even though the aunt exhibited unusual behaviors related to cognitive decline; a doctor ended a visit with a patient at high risk of cognitive decline without completing a cognitive screening; fall prevention education programs provided by occupational therapists and the local Health Unit were not reaching their target population in an effective way to change behaviours of older adults; instructions provided by the hospital on how to manage safety after eye surgery were vague and illness specific.

When indoor environments were arranged in ways that challenged the function of older persons, and formal and informal supervisors did not recognize the hazard or address the hazard in a timely manner, this led to AEs. For example: the landlord of the building inhabited by high number of seniors in advanced age did not adjust the position of window blinds pull cords to allow easier access and use; and the family and CCAC support workers left TUMS® that were regularly used by the senior on a shelf that was difficult to access. Poor safety risk identification and management directly related to the investigated AEs.

Clearly, falls of community dwelling care dependent seniors and their caregivers are complex events. For each fall over 30 contributing factors at all levels within the system were

identified. Any meaningful change and improvements of safety in this population will have to arise from innovative system-wide far-reaching falls prevention programs.

Chapter 4

4 Discussion

In this study, eight case studies were conducted to examine factors that contributed to AEs in care-dependent community living older adults and their caregivers. All of the falls investigated involved adults over the age of 83 years. Only one case involved a caregiver. Over 240 factors were identified as contributors to these falls, each representing a hole in one of the safety defense layers of the Swiss Cheese Model of Accident Causation. When holes on all four defense layers linked, safety barriers were breached and culminated in the fall of the older person. Some of the factors were sharp-end factors and had a direct connection to the AE, such as bending over with a stool for support, but others were latent factors, such as influence of blood pressure medication and poor storage space options, and represented the proverbial 'accident waiting to happen'. Cross-case analysis of the contributing factors from each case was completed and four distinct themes related to safety of older adults emerged.

At first glance it would appear that the identified overarching themes: *Everyday living has become risky*, *Limitations with supervision*, *Disconnects within the system*, and *Poor risk identification and follow-up* add nothing startlingly new. Previous literature has reported that the person-related factors of those requiring care will put these individuals at increased risk for harm. Johnson (2006) found that clients contributed to 30% of AEs found in his study of Homecare AEs. Sears (2008) found that 52% of the AEs identified in Homecare charts were related to the clients caring for themselves. Henriksen et al. (2009) discussed how human factors can affect care and the ability of persons to provide care and vocalized concerns about the fact that the health care system expects good results from elderly patients with co-morbidities that include sensory, physical, and cognitive impairments.

Lang et al. (2008) have also discussed that competent older adults have the right to personal choice and autonomy within their own private living environments, which may lead to situations laden with risk, but private dwellings cannot be regulated to the extent that a public hospital environment can. They also identified multiple dimensions of safety; not just physical but also emotional, social, and functional safety. Safety in community care needs to be individualized to each person. The autonomy and choice older adults and families have within their own homes requires discussion between older adults and their caregivers on how

to balance physical safety while maintaining an older adult's dignity, sense of self, and personal lifestyle choices (Lang & Edwards, 2006). This is demonstrated in the quote "safety for her is maintaining her functionality and independence" (Lang & Edwards, 2006, p. 20). Older adults and care providers do not have a shared understanding of 'acceptable' risk, and this can create tensions between the older person attempting to maintain his/her freedom and the various agencies who are attempting to 'manage' risk (Green & Sawyer, 2010).

The literature also provided evidence about supervision limitations resulting from dynamically changing family structures, and increasing workloads of caregivers. The Canadian Caregiver Coalition has reinforced, in its framework for a Canadian Caregiver Strategy, that more women are in the workforce, which limits their time and availability for caregiving, and that families are smaller and more geographically dispersed, which limits the availability of assistance and opportunities to share the care between family members (Canadian Caregiver Coalition, 2008). As well, home care work for caregivers is often treated as though it should be straightforward and "accomplished naturally" (Purkis, Ceci, & Bjornsdottir, 2011, p. 101). Purkis et al. (2011) described how challenging and complex it was to determine how to care for older adults who are becoming frail. Lang et al. (2009) reported how the emotional, physical, and social needs of the caregiver affect the care provided. These authors also discussed the risk connected with incongruences between skill and knowledge level of caregivers compared to the responsibility level given to caregivers. It is clear from the literature that limitations in supervision increased the risk for older adults requiring care.

The potential negative consequences that arise from a lack of communication, incongruences in communication, fragmentation, and lack of collaboration were also well documented. Masotti et al. (2009) identified that the first priority for formal providers to diminish AEs was to improve communication of formal providers between agencies and within agencies (i.e. nurse to therapist, nurse to nurse). Waugh (2009) reported that partnerships between key services and care providers, both informal and formal, cooperating and complementing each other is essential in providing quality care for those with dementia. Johnson (2006) found that communication challenges between providers contributed to the AEs identified in his study. Lang and Edwards (2006) also reported communication between

clients and care providers, as well as the communication between the multiple organizations (i.e. Homecare, nursing, homemaking, PSW or therapy agencies) was a challenge linked to safety in home care.

The benefits of an integrated care model are well known; as Chen and Thompson (2010) explained “...it is pertinent to re-conceptualize the links between formal service use and informal care based on the older adults’ characteristics and then to move towards an integrated service system” (Chen & Thompson, 2010, p. 287). Integrated care programs are used to decrease fragmentation of services and improve the continuity and coordination of care (Wilhelmson et al., 2011). The cost effectiveness of home and community care can only be seen within the context of a broader, integrated system of care (Hollander, Miller, MacAdam, Chappell, & Pedlar, 2009). Integration of care was seen as a necessity for supporting older adults, as stated by Carstairs and Koen (2009) in their report *Canada’s Aging Population: Seizing the Opportunity*. Integrated care has the potential to improve communication and decrease fragmentation of services, improving care and safety for older adults.

The need for thorough fall risk assessment and strategies to address identified risks has also been acknowledged in research. Speechley (2011) stated that a detailed fall risk assessment and treatment of the modifiable risk factors was an important part of evidence-based strategies to prevent falls. Peel (2011) identified that “despite the availability of policy and practice guidelines, there are still considerable challenges on many levels for integrating best-practice falls prevention strategies” (p.15). Previous research has offered an abundance of tools and education programs to help identify fall risks and to provide suggestions on how to address these risks. The Canadian Falls Prevention Curriculum is a four week, on line course detailing an evidence-based approach to the prevention of falls and fall-related injuries, based on research by Vicky Scott (2007). *Safer healthcare now!* (2010) also provides a kit for providers on how to reduce falls and injuries from falls. Although available, these resources have not been fully implemented by those who care for older adults.

Although the previously published literature provided an idea of ‘what’ happens to put older adults at risk, it did not provide the entire picture. What this study uniquely

contributes to the current body of knowledge is a series of detailed case study examples that explain the greater system-wide contributors that link up, intersect, overlap, and sequentially accumulate to result in an AE. With the use of case study methodology and a systemic investigation, method this study provided not just the ‘what’, but also the ‘how’ and ‘why’ for investigated fall occurrences.

Combining findings from eight case studies provided an insight into four themes of commonalities, patterns, and shared characteristics between unrelated people and events. *Everyday living has become risky*, not just because of multiple health issues and poor personal choices that did not meet the best practice guidelines of formal care providers, but often living has become risky because older adults are compensating and trying to make the best of the situation and their abilities. *Limitations with supervision* contributed to missed opportunities to mitigate deterioration and provide oversight for high risk individuals. Caregiver availability limitations, interdependent elderly couples, and limited caregiving involvement contributed to these missed opportunities. Influence at the supervision level was limited by a caregiver’s resolve to avoid being paternalistic. *Disconnects within the system* were caused by incomplete communication, which led to AEs. This study demonstrated how poor communication can result in unrealistic expectations for recall, poor discharge planning, and poor communication of service availability and options. These disconnects within the system linked to *Poor safety risk identification and follow-up*. Multiple players in the formal healthcare system, as well as policy makers within the general society, have not yet properly identified potential safety risks or the consequences of their actions. For example, publicly funded residences that were marketed to older adults were not being designed to meet the long term needs of older adults with health issues. Making a place accessible and meeting building code did not address safe occupational performance by older adults. When a task cannot be completed safely due to fixed environmental features, an older adult will have to make compromises. These adjustments and compromises bring us back full circle to the first theme, that everyday living has become risky. These safety themes demonstrate how the greater system-wide contributors link up, intersect, overlap, and eventually accumulate to result in an AE.

4.1 Review of Study Purpose and Objectives

The overall purpose of this study was to identify the factors that contributed to AEs in care-dependent community-dwelling older adults and their caregivers with four specific objectives. The following discussion reflects on completion of four specific objectives this project has set to achieve.

The first objective was to conduct the case studies utilizing the SFIM to identify specific safety deficiencies at the four levels of Swiss Cheese Model of accident causation that contributed to AEs. This objective was achieved by conducting eight case studies that identified over 240 different factors that contributed to the falls investigated in this study; 68 at the unsafe acts and decisions level, 101 at the preconditions level, 41 at the supervision level and 37 at the organizational level.

The second study objective was to provide evidence on how the system-wide latent factors combine with the actions of people at the sharp end to cause AEs in care-dependent community dwelling older adults. The evidence from eight case studies demonstrated that safety of older adults who age-in-place is a very complex issue. First, each sequence of events showed the chronological linking of contributing factors. Second, every investigation uncovered both sharp-end and latent contributing factors on all four layers of defenses, symbolically described as holes in the Swiss Cheese. Shrinking or closing these holes will improve safety not only for participants in this study but also for other older adults who for example live in the same building, use the same wheelchair, or experience slow unsupervised decline into cognitive impairment. The fewer and smaller the holes are, the stronger the defenses are, creating a safer system. The content analysis also established interrelation between themes and reinforced findings from Lau et al. (2007) that the “prevention of adverse health events in the home and community requires recognizing the society as a system, in which individuals are embedded in complex physical and social institutions that can pre-dispose them to hazards” (p. 830).

The third objective was to identify safety themes from patterns and similarities across multiple case studies. This objective was achieved by conducting content analysis, which identified the four distinctly different overarching themes of Everyday living has become

risky, Limitations with supervision, Disconnects within the system, and Poor risk identification and follow-up.

The fourth and final objective was to discuss the implications of safety breakdowns and direction for their improvements. The main repercussions for the safety breakdowns found in this study were increased use of healthcare resources, increased pain, increased stress for caregivers and care recipients, and decreased quality of life. Six of the eight investigated events resulted in a visit to the hospital, with two individuals being admitted, and one lady moving from the hospital to LTC. It is unlikely that caring for someone in community will ever become comparable to an ultra-safe high reliability organization, such as the aviation industry or a nuclear power plant, but the healthcare system and care at home can become safer nonetheless. To make everyday living safer for care-dependent older adults, they need knowledgeable and effective support systems that will satisfy their needs. They also need effective communication between elements of the system, timely recognition of safety risks, and serious proactive management of risks to prevent AEs from manifesting. Going back to the words of Mrs. Bee “people [care recipients] are getting lost a little bit...and that’s when the health care system gets costly, because it shouldn’t have happened in the first place.” The people getting lost a little bit does not just apply to care-dependent older adults and their caregivers who get ‘lost’ in the system’s service cracks, but also family members, friends, agencies, health organizations, and policy makers who support and cater to older adults. Changes at multiple levels of the system are needed to safely address the needs of older adults.

4.2 Implications for Practice

There are numerous implications for practice that arose from this study. There will be discussed here through five distinctive topics: the person level, the primary care level, the Homecare level, the provider agency level, as well as the broader society level.

At the older person level, the most beneficial solutions are going to address the personal choices made by older adults that lead to unsafe conditions. Solutions need to ameliorate the poor choices that were driven by the strong desire to stay independent at all costs and not accepting the functional changes that are occurring. The social norm to present oneself in a positive light and not to be perceived as vulnerable prevented individuals from

following up with fall prevention, because that was seen as admitting to being vulnerable (Gopaul & Connelly, 2012). To maximize success, fall prevention messages need to align with an older adult's positive identity, since older adults do not see themselves as being at risk (Dollard, Barton, Newbury, & Turnbull, 2012). Risky choices on the person level were also made if the risk was deemed worthwhile, whether to prevent a move to LTC or to maintain independence. These choices will be harder to ameliorate and will likely create negative relationships if pressed. Each person has a lifelong history of being risky or cautious. Unless the risky choice is going to affect the safety of another individual, one's right to autonomy cannot be taken away. Maladaptive choices also happened when an older adult was making the best of the situation or in error, when the person thought a good choice was being made. These choices were affected by factors out of the person's control and could only be solved by implementing changes further up in the system.

At the primary care level, which includes family physicians, pharmacists, and specialists, solutions are needed to address the ineffectual supervision that was noted in the investigated cases as well as the inadequate policies for safety of older persons. It was often small things that added up to escalate in these falls, and it may only be small things that are needed to de-escalate fall conditions for others in the future; for example arranging recall visits for high fall risk individuals. To correct supervision limitations, primary caregivers are recommended to critically evaluate what role they are currently taking to ensure an older adult is in a safe situation and how that role be enhanced. Conducting a Failure Modes Effect Analysis (FMEA) with a multi-disciplinary team may assist with this critical evaluation. It "is a systematic, proactive method for evaluating a process to identify where and how [practice process] might fail and to assess the relative impact of different failures, in order to identify the parts of the process that are most in need of change" (Institute for Healthcare Improvement, 2011, p. 1). This analysis needs to be followed with a critical review of what role is practical to take in addressing the areas most in need of change in order to ensure an older adult is in a safe situation and avoiding the potential AE (i.e., is it more practical to recall high fall risk individuals bimonthly or twice yearly, what are the potential consequences of either choice?). Inadequate policies were another issue at this primary care level that can be addressed. Some issues identified in cases studies that should be addressed are: written reminder, in addition to the verbal instructions, given by pharmacist with a

medication change; need for a policy on recall process in the doctor office for those at high risk of deterioration or cognitive decline; more patient education regarding pre-cataract surgery to communicate the amount of assistance that will be needed after surgery and to offer possible local options for acquiring this assistance.

At the formal Homecare level one of the most confounding contributing issues found was related to the fact that home services that were meant to improve the life of older persons did not match their lifestyle or needs. This mismatch contributed to the ‘firing’ of services and increased the potential for an AE with the loss of formal oversight. It needs to be acknowledged that this issue is shared with provider agencies as well, but PSW remuneration is one latent factor that contributes to the agency’s difficulty with consistent scheduling and consistent workers, especially for daily visit clients. PSWs in the community are paid a lower wage than those who work in LTC, and due to travel time and down time between clients, community PSWs need to work more hours for the same amount of paid time. These system-wide Homecare issues contribute to inconsistent visit times and multiple workers in one home creating the mismatch between client need and services offered. Addressing PSW remuneration may help solve this mismatch. Another issue at the formal Homecare level that needs to be addressed is better communication with primary care, particularly when a person with high risk of deterioration or cognitive decline has declined further Homecare service. Sending a discharge summary to the family doctor will alert him/her that Homecare is no longer overseeing the person and, thereby, allow the doctor to follow-up with the older adult and provide oversight. These issues align with recommendations in a recently released report from Ontario’s Senior Strategy, *Living longer, living well* (Sinha, 2013)

Implications for practice related to agencies include the following: therapy agencies, public health units, and the Alzheimer’s society. The providers from these agencies can be more effective in their role of improving the safety of seniors if they focus on effective knowledge translation. This study found that ‘home safety’ and ‘fall prevention’ education programs and messaging were not being heard by end users. Older adults and their caregivers were also unaware of where to access and when to access support when physical or cognitive declines occurred. Resources and solutions to improve the safety of seniors are available, but these resources need to be evident and meaningful to the person meant to receive the

message. A critical review of the effectiveness of education and messaging could ensure optimal utilization of resources.

The last topic to address in implications for practice is that of the broader society. Disjointed communication, inadequate physical environments, a diminished level of supervision, and inadequate policies for care are some societal level issues that did not match the needs of seniors in this study. The system as the whole would be more effective if a more serious reflection on the needs of older adults was conducted. Family and friends require greater awareness about the importance of and the need for thoughtful oversight, as indicated in the previous paragraph. Other specific areas for improvement are the choice of public housing and supportive care buildings that need better designs to meet the needs of older adults. It can be recommended that when an environment is designated for seniors, the end users should be consulted so the final product allows seniors with multiple health conditions to complete their daily functional tasks. Older adults are a heterogeneous population group. The majority of those over 65 years of age are very functional, but as they age-in-place, many will eventually have health issues that require their physical environment to be more accommodating in order to continue safe occupational/task performance. To meet the needs of elderly who will age-in-place, in addition to universal accessibility criteria (i.e., for entrances, doors, and halls), age-in-place design features need to be included (i.e., accessible storage in the kitchen, grab bar installation in the bathrooms, easy to manage windows).

Addressing each of these small changes will translate into major improvements in the overall safety of our elders. Further research can assist with optimizing solutions and determining the cost-effectiveness of these sorts of preventative interventions.

4.3 Future Research

To find optimal solutions for increasing the safety of care-dependent older adults and their caregivers, future research should take a closer look into why there is a seemingly casual attitude in our society when it comes to the safety of older adults. Is this a result of poor knowledge translation from research into community health care practice and society in general, or a result of heavy workloads or caregiver demands, or some other factors? How can informal overseers of older adults become more aware of the importance of their role and

be more effective in their role? Further case study research investigating AEs with a focus on where communication broke down, how it broke down, and why it broke down could provide valuable information for improving ineffectual and incomplete communication. Further, investigation into whether training health care professionals in motivational interviewing, in conjunction with safety education sessions, would improve outcomes is warranted, to see if supervision effectiveness could be improved. Research investigating solutions to address the mismatch between Homecare services and client needs and lifestyles is also needed. Investigating incidents that involve the ‘firing’ of services will provide insight into the issues and possible solutions to address this important topic. Methodologically, further research should examine if the recently published *Incident Analysis Framework* (Incident Analysis Collaborating Parties, 2012) from the Canadian Patient Safety Institute is capable of producing similar results in less time, while preserving the depth, comprehensiveness, and descriptiveness of the SFIM.

4.4 Limitations to the Study

Although utmost care was exercised in completion of this study, several limitations should be noted. The first is the possibility of selection bias, the tendency to only use those parts of the data that support potential preconceived theories the researcher may have on the topic (French et al., 2001). This is related to Stake’s (2005) concern that there is the risk in, case studies methodology, for the researcher to pass along his/her meaning and interpretation of the event and potentially miss other meanings as the story of the case is built. Use of the tertiary participants in the SFIM workgroup decreased the risk of these potential biases, by having multiple viewpoints analyzing each case. Writing the case summaries with detailed descriptions allowed the researcher to make comparisons and construct new interpretations. Each final report was revised by another researcher, adding to rigor.

The second limitation is that, as a retrospective investigative method, the SFIM relies on recall from participants, and the risk for recall bias is ever present. Humans rarely think about how they made decisions or what their mindset was at the time of an incident, and it takes the efforts and skill of the investigator to ensure the depth of the story is achieved through in-depth interviewing (Zecevic et al., 2007). The researcher is an experienced occupational therapist familiar with interviewing older persons in their homes. The

researcher was consistently mentored throughout this project by an experienced human factors expert and SFIM investigator of seven years, to assure consistency and depth of detail in the story across cases. However, because it is an art and science to complete an investigation of any AE, it is possible that a different investigator, a different support team, or an alternate expert mentor might have produced slightly different results.

The last limitation is related to the SFIM, the investigation tool used. Lundberg, Rollenhagen and Hollnagel (2009) warn that different accident investigation models may give priorities to different factors that contributed to the event. Some may focus more on latent factors in the system; others may focus more on the sharp end, immediate factors surrounding the incident. This can lead to omitting some aspects of an investigation that are important in other investigative techniques. A number of other systemic investigation methods/tools have been described in literature, such as the Canadian Root Cause Analysis Framework (Canadian Patient Safety Institute (CPSI), 2006), which has been updated to the Integrated Analysis Framework (Incident Analysis Collaborating Parties, 2012); the System-Oriented Event Analysis (SOEA) (Chuang, Pan, & Huang, 2009); the Systems-Theoretic Accident Modeling and Processes (STAMP) (Leveson, Dulac, Marais, & Carroll, 2009); the Integrated Procedure of Incident Cause Analysis (IPICA) (Ferjenik, 2011); and the Functional Resonance Accident Model (FRAM) (Hollnagel, 2012).

4.5 Utility of the SFIM

The SFIM was a valuable tool for identifying the contributing factors and separating them into systemic levels. It was time consuming; on average, each case study took over 25 hours to investigate, consolidate, summarize the findings, and prepare the final report. Building the sequence of events (SOE) was a thought provoking process that forced the researcher and the SFIM workgroup to examine information from multiple sources and generate new hypotheses as additional information became available, to ultimately make the best possible sense of the emerging story. The SOE figure (available in the full SFIM reports included in Appendices K-R) allows a person to chronologically follow how events build on one another. One issue noted with the creation of the SOEs was the fact that duplication of the same contributing factor was discouraged. This was done to avoid repetition in the Swiss Cheese summary table. Hence, factors that might have repeatedly contributed to multiple

safety significant events and potentially had more influence on the outcome were not captured. One factor may have contributed to more than one safety significant event, but the sequential nature of the SOE did not allow for cross connections to be made. This was a concern for example, when the SOE was not able to link how one factor, such as cognitive decline identified a month ago, also contributed to a safety significant event further on in time. The summary and the within case analyses did allow for these connections to be made, just not as concisely as a visual diagram.

Chapter 5

5 Conclusions

Older adults require a comprehensive approach to their health care in order to safely remain in their own homes and age in place. An intricate system of multiple players, on multiple levels, influences care-dependent older adults and their caregivers. When the mechanisms that are meant to protect the safety of older adults do not interact adequately, unnecessary harm can result. Previous research identified factors that contributed to AEs based on retrospective chart reviews and opinions of home healthcare experts. However, to enable a more accurate and detailed identification of the contributing factors and how they link together and affect one another to result in an AE, it was necessary to conduct a thorough investigation; an investigation involving interviewing the affected individuals, their significant others, and others who were directly or remotely involved. This investigation also included examining the chronological sequence of events and the factors that contributed to safety significant events on multiple levels within the system. The present study utilized the SFIM to complete eight comprehensive case studies of falls in care-dependent older adults. It provided an insight into how multiple components of the system linked and overlapped to result in the falls. On average 35 (range 22-47) contributing factors were identified per investigation. Many of the safety deficiencies were a result of small issues compounding themselves and escalating over time, ultimately impairing a senior's safety. Small things matter when it comes to safety for older adults. Across-cases analysis identified four themes: everyday living has become risky, supervision limitations, disconnects in the system, and poor safety risk identification and follow-up. Findings show that while older adults were completing normal everyday tasks, their decisions and acts combined with personal health issues, environmental issues, and larger systemic issues and led to safety challenges beyond their capacity to manage. Supervision of these older adults was limited and often ineffectual. This contributed to more unsafe conditions that were not addressed and amelioration opportunities that were lost. Disconnects in the system also resulted in lost opportunities to prevent falls. This was primarily due to poor communication between components of the healthcare system and offering services that did not match the needs of end user. Safety was also impaired when safety risk identification was poor and follow-up from family, friends,

and healthcare providers was lacking. With hindsight, it is possible to see the lost opportunities for intervention, but with the foresight offered from these investigations, we can reclaim these opportunities and improve safety for the growing demographic of older adults, many of whom would prefer to age-in-place.

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Appendices

Appendix A: Adverse Event Definitions From the Literature

An adverse event has been defined in previously published literature in various ways:

- “unintended injuries or complications resulting in disability at the time of discharge, death, or prolonged hospital stay and that is caused by healthcare management rather than by the patient’s underlying disease process” (Baker et al., 2004, p. 1679)
- “any harm to the client that negatively affects their [sic] overall health and/or functioning and is the result of care actions and/or inactions rather than the client’s underlying condition” (Johnson, 2006, p. 128).
- an “event or occurrence, which becomes apparent during the delivery of home care services and which [sic] have a negative or potentially negative impact on: patient outcomes, family or support care and resources utilization” (Masotti et al., 2007, p. 63)
- “events which meet the following criteria: “(1) an unintentional injury or complication (2) which results in disability, death or increase use of healthcare resources (e.g. additional attendance by healthcare professionals, prolonged home care stay, or hospitalization) and (3) is caused by health care management” (Sears, 2008, p. 67).
- “unintended injury/complication that results in disability, death or increased use of health care resources and is caused by health care management” (Doran et al., 2009, p. 168)
- The WHO would like to come to a common definition and utilizes “Patient safety incident: an event or circumstance which could have resulted, or did result, in unnecessary harm to a patient. Harmful incident (adverse event): an incident that resulted in harm to a patient.” (Runciman, Hibbert, Thompson, VanderSchaat, & Lewalle, 2009, p. 21) (Runciman, W., Hibbert, P., Thompson, R., VanderSchaat, T., & Lewalle, P. (2009). Towards on international classification for patient safety: Key concepts and terms. *International Journal for Quality in Healthcare*, 21(1), 18-26.)

Appendix B: Comparison of Six Studies Examining Adverse Events in Health Care

Study	Adverse event (AE) category/criteria used for identification of AE	Prevalence rate %
Baker et al. (2004)	Unplanned admit before index admit	16.8
	Unplanned readmission after discharge from index admit	13.6
Top AEs identified in a random selection of 20 Canadian acute care hospitals. Rates were based on 3 745 patient charts (excluding psychiatric and obstetric cases).	Adverse drug reaction	3.1
	Hospital acquired infection/sepsis	3.1
	Hospital incurred patient injury	2.9
	Unexpected death	2.0
	Unexplained transfer to another acute care hospital	2.0
<i>Overall AE rate of 7.5%</i>	Unplanned transfer from general care to ICU	1.9
	Dissatisfaction reported in chart	1.4
	(Note: the list above were the criteria used to identify patient charts with potential AE, a breakdown of the actual events found was not given)	(numbers relate to percentage of charts initially identified with AE criterion)
Johnson (2006)	Injurious falls	46.2
	Non injurious falls	15.4
Based on a chart review of 400 randomly selected Albertan home care clients in 2004 (all long term clients, no palliative clients).	Pressure ulcer	3.8
	Adverse drug event	23.1
	Mental harm/injury	3.8
	Other (hospital admission, LTC admission, unexpected death)	7.7
<i>Overall AE rate of 5.5%</i>		(percentages were calculated from cases with an AE)
Madigan (2007)	Unexpected death	5.1
	Unexpected admission to LTC	1.8
AE rates based on the 2003 data base of over 3 million Medicare clients. Categories are derived from the Centre for Medicare and Medicaid Services' outcomes-based quality improvement initiative.	Emergency care for fall or accident at home	3.3
	Emergency care for wound infection or deteriorating wound status	2.6
	Emergency care for improper medication administration or side effect	0.9
	Emergency care for hypo/hyperglycemia	0.9
<i>Overall AE rate of 13.1%</i>	Development of urinary tract	5.7

	infection	
	Decline in oral medication management	21.4
	Increase in number of pressure ulcers	1.3
	Substantial decline in ≥ 3 ADLs	0.4
	Discharge to community with wound/medication management requirements	59.7
	Discharge to the community needing toileting assistance	14
	Discharge to the community with problematic behaviours	4.8
		(percentages were calculated from cases with an AE)
Masotti, Green, Shortt, Hunter, & Szala-Meneck (2007) AE categories identified by a group of 31 invitees with experience and interest in home health care (varying from front line staff to management and academic researchers).	Injury and falls to clients	NA
	Medication issues	
	Infections and wounds	
	Client abuse or neglect	
	Unexpected death or critical illness or disability	
	Caregiver or client unit of support system deterioration (i.e., caregiver burnout)	
Sears (2008) Based on chart review of 430 clients in south eastern Ontario receiving RN and RPN services, discharged in 2004/2005. <i>Overall AE rate of 13.2%</i>	Injurious falls	24.6
	Adverse drug event	16.4
	Pressure ulcer/skin breakdown	11.5
	General decline	11.5
	Delayed healing	9.8
	Infection	8.2
	Congestive heart failure	6.6
	Catheter injury	4.9
	Bowel impaction/obstruction	3.3
	Bleed	1.6
	Dehydration	1.6
		(percentages were calculated from cases with an AE)
Doran, Hirdes, Blais, Baker, Pickard, & Jantzi (2009)	New fall	11
	Unintended weight loss	10.4
	New emergency room visit	8.3

This study utilized the RAI-HC data of 238 958 long term home care clients (2003-2007), from Ontario, Nova Scotia, and Winnipeg, *An overall AE rate was not given*

New hospital visit	7.7
Cognitive performance decline	5.7
New caregiver decline	3.3
New urinary tract infection	1.9
Pressure ulcer deterioration	1.8
New pressure ulcer	1.7
New pneumonia	0.9
New bowel problem	0.8
New dehydration	0.7

(percentages were calculated based on all reviewed charts, some cases with more than one AE)

Appendix C: Western University Ethics Board Approval



Use of Human Participants - Ethics Approval Notice

Principal Investigator: Dr. Aleksandra Zecevic
Review Number: 18643E
Review Level: Delegated
Approved Local Adult Participants: 20
Approved Local Minor Participants: 0
Protocol Title: Sharp-end and blunt-end factors that contribute to adverse events in community home health care
Department & Institution: Faculty of Health Sciences, University of Western Ontario
Sponsor:
Ethics Approval Date: **Expiry Date:** November 30, 2016
Documents Reviewed & Approved & Documents Received for Information:

Document Name	Comments	Version Date
UWO Protocol		
Letter of Information & Consent	Caregiver / Care Receiver	2012/01/03
Letter of Information & Consent	Generic	2012/01/03

This is to notify you that The University of Western Ontario Research Ethics Board for Health Sciences Research Involving Human Subjects (HSREB) which is organized and operates according to the Tri-Council Policy Statement: Ethical Conduct of Research Involving Humans and the Health Canada/ICH Good Clinical Practice Practices: Consolidated Guidelines, and the applicable laws and regulations of Ontario has reviewed and granted approval to the above referenced revision(s) or amendment(s) on the approval date noted above. The membership of this REB also complies with the membership requirements for REB's as defined in Division 5 of the Food and Drug Regulations.

The ethics approval for this study shall remain valid until the expiry date noted above assuming timely and acceptable responses to the HSREB's periodic requests for surveillance and monitoring information. If you require an updated approval notice prior to that time you must request it using the UWO Updated Approval Request Form.

Members of the HSREB who are named as investigators in research studies, or declare a conflict of interest, do not participate in discussion related to, nor vote on, such studies when they are presented to the HSREB.

The Chair of the HSREB is Dr. Joseph Gilbert. The UW OHSREB is registered with the U.S. Department of Health & Human Services under the IRB registration number IRB 00000940.

Signature _____

Ethics Officer to Contact for Further Information

<input checked="" type="checkbox"/> Janice Sutherland [REDACTED]	<input type="checkbox"/> Grace Kelly [REDACTED]	<input type="checkbox"/> Shantel Walcott [REDACTED]
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This is an official document. Please retain the original in your files.

Appendix D: Page Given to Family Health Team to Facilitate Participant Recruitment

Sharp-end and blunt-end factors that contribute to adverse events in community home health care

Identification of Eligible Participants

The following questions will help with identifying eligible caregiver/care receiver units for the adverse events study.

- ☐ Does the individual speak English?
- ☐ Is the care receiver over the age of 65 years?
- ☐ Does the care receiver have live-in caregiver who provides care for at least 1 activity of daily living (i.e., assistance, which can be physical-hands on, or verbal cueing, with bathing, dressing, toileting, feeding, transfers, routine medication management)
- ☐ Was the individual involved in an incident that did have, or potentially could have had, a negative impact on the person's health and well-being, and was related to care received or provided at home? Suitable events for this study would include:
 - a) falls (an unintended landing on a lower level)
 - b) injuries due to any cause
 - c) medication mismanagement
 - d) pressure ulcers
- ☐ Did this incident occur within the last week?

If yes to all questions, the individual is eligible to participate in the study.

Please ask the person if they are willing to have the researcher contact them for a face to face interview.

Suggested wording may be:

"A research study about the reasons why accidents happen in community health care is being completed. The researchers want to improve the safety for older adults with health issues who remain in the community and have family help take care of them at home. The study will involve the researcher coming to your home and asking you some questions to investigate what lead up to your experience. If you are interested, you will need to fill out this page with your contact information and I will give you an information package. I will forward the contact information to the researchers, and they will get back to you about setting up an interview. You have the option of declining at any point if you decide to agree."

(Usually two interviews will be all that is required, and there may be 2-3 follow-up telephone calls to clarify information. All the required data will be collected within two weeks of initial contact.)

If he/she agrees, please provide the information package (**Letter of information** [caregiver and care receiver] and **consent form**) explaining the study more and have the contact information form filled out. Please call Dorothy at 519-██████████ with the individual's name and number.

Feel free to call myself, Dorothy Gotzmeister, for any clarification (519) ██████████. (Thank you!).

Appendix E: Letter of Information-Caregiver and Care Receiver With Consent Page

**LETTER OF INFORMATION
(caregiver and care receiver)**

Sharp-end and Blunt-end Factors that Contribute to Adverse Events in Community Health Care



Principal Investigator:

Aleksandra Zecevic, PhD
Faculty of Health Sciences,
University of Western Ontario



Co-Investigator:

Dorothy Gotzmeister MSc Candidate, OT Reg. (Ont.)
Health and Rehabilitation Sciences Graduate Program
University of Western Ontario



You are invited to participate in a research study. This letter contains information to help you decide whether or not to participate in this research project. It is important for you to know why the data is being collected, why the research is being conducted, and what we are asking you to agree to. Please take the time to read this carefully and feel free to ask questions if anything is unclear.

This project will look at identifying what factors contribute to adverse events in health care, specifically community home health care. This investigation is being completed to better understand causes of adverse events and to improve the safety of community care.

If you decide to participate, a researcher will interview you and any others involved, to collect detailed information about things that contributed to the adverse incident. Interviews will be conducted in your home. Interviews and telephone calls will be digitally recorded and the location of the event will be photographed. We are asking for your permission to collect and use the information from your interview and your health record for research purposes. All the information collected will be de-identified (your name or identity will not be revealed) and will be entered into a Systemic Adverse Events Investigative Method Database (Falls Database).

If you agree to participate, data relating to your health history and current care will be reviewed and summarized. **Your case will be given a unique identifying code,**

and any personal information will be removed, i.e., your name, address, telephone number. All information about your identity will be kept confidential.

All information from the interviews will be stored in a secure, locked room at the University of Western, Ontario. Seven years after study completion all hard copies of data will be destroyed. At the end of the study (approximately one year), any digitally recorded interviews will be destroyed.

The information in the Falls Database will be identified only by a unique code number. The Principal Investigator will keep the master list of codes in the Falls Database in a secure location at the University of Western Ontario. The Falls Database is managed by EmPower Health Research Inc. and is stored on a secured web server. The data in the Falls Database will be retained indefinitely to allow us to look at trends over time. **The data might potentially be shared with other researchers but it will not include any personal identifiers.**

Participation in this study is voluntary. You may refuse to participate, or refuse to allow your data to go to the Falls Database, at any time-- with no effect on your future care. If you wish to stop your participation just let the investigator know. The consent to participate in the study will be retained at the University of Western Ontario. You do not waive any legal rights by signing the consent form.

If the results of the research are published or presented at scientific meetings, your name will not be used and no information that discloses your identity will be released or published without your explicit consent.

You will not be compensated for your participation in this study.

There are no known risks to your participation in this study. All records and the Database are secured and access is limited to authorized personnel. You will not benefit directly from participation in this research; however the results of our study may help minimize the risk of others in the community experiencing an adverse event

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research. If you have any questions about the research or the database you may contact Dr. Aleksandra Zecevic. She can be reached at 519 [REDACTED]. If you have any questions about your rights as a research participant or the conduct of the study you may contact The Office of Research Ethics at (519) 661-3036 or by email at ethics@uwo.ca.

This letter is for you to keep. You will also be given a copy of the consent form if you agree to sign it.

INTERVIEW CONSENT FORM for care giver and care receiver

(each need to sign their own copy)

Sharp-end and Blunt-end Factors that Contribute to Adverse Events in Community Health Care



Principal Investigator:

Aleksandra Zecevic, PhD
Faculty of Health Sciences,
University of Western Ontario



Co-Investigator:

Dorothy Gotzmeister MSc Candidate, OT Reg.

(Ont.)

Health and Rehabilitation Sciences Graduate Program
University of Western Ontario



I have read the Letter of Information, have had the nature of the study explained to me, and I agree to participate. All questions have been answered to my satisfaction.

Name of participant (Print)

Signature of participant

Date

Name of legally authorized representative (Print)
(If appropriate)

Signature of legally authorized representative
(If appropriate)

Date

Name of person obtaining consent (Print)

Signature of person obtaining consent

Date

Appendix F: Contact Information Form

Sharp-end and blunt-end factors that contribute to adverse events in community home health care

ID Code: _____

Completed by: _____

Contact Information

1. Name: _____

2. Gender (please circle): Male Female

3. Address:
Street number and name: _____

Apartment #: _____

City: _____

Postal Code: _____

4. Home Phone Number: () _____


5. Briefly describe the incident the study will examine:

Please call Dorothy for pick-up of this page—519 [REDACTED].

Appendix G: Mini Mental State Exam

Mini mental state exam (MMSE) (<http://medicalimages.wordpress.com/#jp-carousel-727>)

The mini mental is a standardized screening tool that will reveal if an individual may have a mild (score 21-24), moderate (score 10-20), or severe (score less than 10) cognitive impairment. It takes no more than 10 minutes to complete.

Maximum score	Score	
		Orientation
5	—	What is the (year) (season) (date) (day) (month)?
5	—	Where are we: (state) (county) (town or city) (hospital) (floor)?
		Registration
3	—	Name three common objects (e.g., "apple," "table," "penny"); Take one second to say each. Then ask the patient to repeat all three after you have said them. Give one point for each correct answer. Then repeat them until he or she learns all three. Count trials and record. Trials: —
		Attention and calculation
5	—	Spell "world" backwards. The score is the number of letters in correct order. (D _ L _ R _ O _ W _)
		Recall
3	—	Ask for the three objects repeated above. Give one point for each correct answer. (Note: recall cannot be tested if all three objects were not remembered during registration.)
		Language
2	—	Name a "pencil" and "watch." Repeat the following: "No ifs, ands or buts."
1	—	Follow a three-stage command:
3	—	"Take a paper in your right hand, fold it in half and put it on the floor."
1	—	Close your eyes.
1	—	Write a sentence.
1	—	Copy the following design.
		
		Total score: —

Appendix H: Guidelines for Initial Investigation Interview

Questions for the caregiver and care receiver:

1. Can you please tell me a little bit about yourself (asked of both the care receiver and caregiver)? Ask about age, diagnosis, physical limitations (general range of motion, strength), functional abilities (speech, hearing, vision, mobility aids), medications.
2. a) How long have you been receiving care from _____? OR
b) How long have you been providing care for _____?
3. a) What types of care do you receive? OR
b) What types of care do you provide for _____?
Can prompt about types of care (i.e., meals, shopping, cleaning, laundry, transportation, and personal care-dressing, toileting, transfers, bathing, medication assistance).
4. Please describe for me the adverse event that happened in as much detail as possible. Have the persons involved visit the site of the AE and recreate the situation.)
5. Would you further describe.....probe for any further details required to complete the F-SHEL data collection tool (see below).
6. Do you mind if I take some pictures of.....the area the event occurred, the equipment involved, any injury sites?

Before completing the interview take the participant back through the steps they have described in order to confirm the data. "Let me see if I've got it right. First you....then...and then....."

Ensure that contact information is recorded for any other persons who will be contacted for further follow up (i.e., neighbor, friend, health care workers).

Details required for F-SHEL data collection tool:

For this study 'Faller' will relate to the caregiver and care receiver who had the adverse event.

Table H1: Examples of interview topics for components of F-SHEL (Faller, Software, Hardware, Environment, and Liveware) data collection tool for investigation of falls in seniors.

F-SHEL components	Interview topics
F – faller	Describes the faller: demographic information (age, gender, marital status, living arrangement, and familiarity with immediate environment), recent adverse events (death of a friend or family member), medical and history of falling, medications currently used, acute pain, recent hospitalizations, ability to perform activities of daily living, stress (domestic, financial, bereavement), fatigue, sleep, attention and memory, perception, decision making, attitudes, fear of falling, balance, physical activities, alcohol consumption, and other known internal risk factors for falling.
L – liveware	Enquires about human to human interactions at the scene of the incident as well as in the life of the faller: verbal communication at the time of the event, language barrier, body language and non-verbal clues, interaction with others, cultural differences, group influences, cooperation, attitudes, anxiety, behavior, apprehension, family and social network, supervision and monitoring, decision making, safety and risk management, commitment and involvement of family and the social network, real and perceived pressures, habits, etc.
E – environment	Includes: (a) internal environment or conditions in which people live like lighting, room temperature, floor condition, noise, vibration; and (b) external environment like weather, elements, infrastructure (sidewalks, bus stops, unmarked inclinations), geographic particularities, seasonal changes, maintenance of facilities and equipment, etc.
H – hardware	Explores equipment utilized by the faller or present at the scene. If applicable the following factors can be investigated in detail: use of a assistive device (design, reliability and safety), stairs or ladders, footwear (comfort, design), shopping carts, physical space, arrangement of hardware, display and auditory considerations, etc.
S – software	Includes any written information such as regulatory requirements (e.g., bathroom grab bars, raised toilet seats), manuals, service bulletins, knowledge and training information (e.g., assistive devices), automation, equipment licenses (e.g., regulation of safety requirements for imported devices), medical information (e.g., expiring dates on medications), etc.

(Zecevic, Salmoni, Lewko, & Vandervoort, 2007)

Note: This is not an extensive list of questions but rather a guide.

Appendix I: Letter of Information-Generic and Consent Page

LETTER OF INFORMATION – Generic

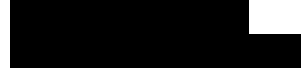
(anyone except the care giver and care receiver, who were directly involved in the adverse event)

Sharp-end and Blunt-end Factors that Contribute to Adverse Events in Community Health Care



Principal Investigator:

Aleksandra Zecevic, PhD
Faculty of Health Sciences,
University of Western Ontario



Co-Investigator:

Dorothy Gotzmeister, MSc candidate, OT Reg. (Ont.)
Health and Rehabilitation Sciences Graduate Program
University of Western Ontario



This letter contains information to help you decide whether or not to participate in this research project. It is important for you to know why the data is being collected, why the research is being conducted and what we are asking you to agree to. Please take time to read this carefully and feel free to ask questions if anything is unclear.

Recently _____, experienced an injury, or close call that could have resulted in an injury. An investigator trained in the Systemic Adverse Events Investigative Method has been assigned to investigate this adverse event. The investigator would like to interview you to collect detailed information about things that contributed to the event. Interviews will be audio recorded and the location of the adverse event will be photographed. The information collected will be de-identified (your name or identity will not be revealed) and entered into a Systemic Adverse Events Investigative Method Database (Falls Database). We are asking for your permission to collect and use the information from your interview for research purposes. This investigation is done to better understand causes of adverse events in the community and improve the safety of community care.

If you agree to participate, data you provide will be reviewed and summarized. **Any identifying features, such as name, address or telephone number, will be removed, and a unique identifier number will be used.** All data (with personal identifiers removed) is kept confidential and stored at a secure location at the

University of Western Ontario for up to seven years. Any digitally recorded interviews will be destroyed after the study is complete.

Adverse events will be included in the Falls Database, where it will be identified only by a unique code number. The Principal Investigator will keep the master list of codes in the Falls Database in a secure location at the University of Western Ontario. The Falls Database is managed by EmPower Health Research Inc. and is stored on a secured web server. The data in the Falls Database will be retained indefinitely to allow us to look at trends over time. The data may potentially be shared with other researchers but it will not include any personal identifiers.

Participation in this study is voluntary. You may refuse to participate, or refuse to allow data to go to the Falls Database at any time. If you wish to stop your participation just let the investigator know. The consent to participate in the study will be retained at the University of Western Ontario.

Your decision to participate will not influence your relationship with the individual who experienced the adverse event. You do not waive any legal rights by signing the consent form.

If the results of the research are published or presented at scientific meetings, your name will not be used and no information that discloses your identity will be released or published without your explicit consent.

You will not be compensated for your contribution to this study.

There are no known risks to your participation in this study. All records and the Falls Database are secured and access is limited to only authorized personnel. You will not benefit directly from participation in this research however the results of this research may help minimize the risk of adverse events occurring to others in community care.

Representatives of The University of Western Ontario Health Sciences Research Ethics Board may contact you or require access to your study-related records to monitor the conduct of the research. If you have any questions about the research or the database you may contact Dr. Aleksandra Zecevic. She can be reached at 519- [REDACTED]. If you have any questions about your rights as a research participant or the conduct of the study you may contact The Office of Research Ethics at (519) 661-3036 or by email at ethics@uwo.ca.

This letter is for you to keep. You will also be given a copy of the consent form if you agree to sign it.

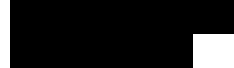
Interview CONSENT FORM – Generic

Sharp-end and Blunt-end Factors that Contribute to Adverse Events in Community Health Care**Principal Investigator:**

Aleksandra Zecevic, PhD
 Faculty of Health Sciences,
 University of Western Ontario

**Co-Investigator:**

Dorothy Gotzmeister, MSc candidate, OT Reg. (Ont.)
 Health and Rehabilitation Sciences Graduate Program
 University of Western Ontario



I have read the Letter of Information, have had the nature of the study explained to me, and I agree to participate. All questions have been answered to my satisfaction.

 Name of participant (Print)

 Signature of participant

 Date

 Name of person obtaining consent (Print)

 Signature of person obtaining consent

 Date

Appendix J: Guidelines for Investigative Interview With ‘Others’

1. My name is _____. I am a health and science student the health and rehabilitation graduate program at the University of Western Ontario. I am doing a study on safety in home care. Mr. and Mrs. _____ are participating and have told me about their recent _____ (the AE), and I was hoping that you had 5-10 minutes to clarify for me details about _____. (probe for details to about the sequence of events, and if applicable about policies and procedures related to the AE, best practices related to the AE, supervision levels at the time, personalities, cooperation, education given)
2. Is there anything else you would like to share with me about _____ (the AE)?

Appendix K: Mr. Dee Full SFIM Report

SFIM

Case ID: 8100112

Date: 2013-04-03

Subject #: 14801

Fall Information

2.1 Date of the fall: 2011-12-23

2.2 Day: Friday

2.3 Time of fall: 24-hour clock

14:00

2.4 Witnesses: ☐ Un-witnessed

2.5 Location of the fall: ☐ Indoors

☐ Private Residence

☐ Kitchen

2.6 Activity at the time of the fall:

☐ Standing on both feet

2.6a Was this person multi-tasking? ☐ Yes

2.7 Action by the faller prior to loss of balance:

☒ Reaching forward

☒ Other, please specify:

Stirring bread cubes for turkey stuffing.

2.8 Type of fall:

☐ Stumble

Stumble backwards due to dizziness/unclear vision.

2.9 Direction of the fall:

☒ Back

2.10 Environment at the fall location:

☒ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☒ None

2.12 Footwear worn by the faller at the time of the fall:

☒ Shoes

2.13 How did faller get up after the fall?

☒ Assisted by another person

☒ Family/Friend/Roommate

Please specify how the faller was assisted:

☒ Other, Please specify:

Wife used a chair to assist faller up.

2.14 Injury? ☒ No

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☒ Yes, please specify:

Not his usual routine. Stuffing was being made for Christmas dinner.

SFIM

Case ID: 8100112

Date: 2013-04-03

Subject #: 14801

Information About the Faller**3.1. Demographics:**Year of birth: 1928 Age Calculated: 83Gender: ☒ MalePopulation: ☒ Senior**3.2 Falls history:**☒ Rare faller (fell only this one time in the past year)**3.4 Marital status:**☒ Married**3.5 Mental status:**☒ Normal, alert and oriented**3.6 MMSE score:**25**3.7 Education:**☒ Secondary school completed**3.8 Mobility aids:**☒ Cane☒ Occasionally☒ Walker with 4 wheels for indoor or outdoor use (rollator) ☒ Occasionally**3.9 Other aids used by the faller:**☒ Bath bench/shower seat☒ Bathroom grab bar☒ Glasses☒ for reading

☒ Rubber bathmat

3.10 Medical problem at the time of the fall:

☒ Blood pressure (high or low)




☒ Dizziness or vertigo


☒ Other, please specify:

History of blood clots.

3.11 Medications:

3 _____ Number of prescription medications used by the faller on the day of the fall

   Medication Name: Peridopril Erbumine; Coversyl

   Medication Name: Warfarin Sodium; Coumadin

   Medication Name: Risedronate Sodium; Actonel

2 _____ Number of over-the-counter medications used by the faller on the day of the fall

   Medication Name: Vitamin C

   Medication Name: Vitamin D

SFIM

Case ID: 8100112

Date: 2013-04-03

Subject #: 14801

Investigative Report Summary

The faller fell backwards on December 23, 2011, while in his kitchen. He was walking through the kitchen to sit down on his chair at the table, while his wife was in the next room setting up Christmas decorations. To help his wife out, he stopped at the counter to stir up the bread cubes that were drying for Christmas turkey stuffing. While completing the task his vision became blurry, he stumbled backwards and landed on the ground. He was not injured. His wife heard the fall and came into the kitchen to assist him in getting up.

Faller

The faller was an 83-year-old gentleman who lived with his wife. They had lived in the same home for 55 years. The house was small, resulting in limited space for a rollator walker. Faller's bedroom and bathroom were on the main floor of the home.

Faller was an alert, competent man, but required some assistance with dressing, due to the difficult nature of putting on TED (thrombo embolic deterrent) pressure support stockings. He had poor balance, and limited range of motion in his right arm (due to an accident from childhood). In 2009, he slipped on snow while exiting his car, which resulted in a fractured left hip. He had poor proprioception in his left foot. He had a history of blurred vision when he stood up too fast since his hip repair, which he compensated for by getting up slowly and pausing until the blurriness cleared. Within the last year or two he also noticed blurred vision when he did a lot of head movements. The faller assumed the head movement blurriness was linked with previously experienced episodes of blurriness and did not mention it to his wife. He continued to compensate with slow movements and pausing until his vision cleared.

The faller was interested in staying active, and tried to exercise daily with some leg strengthening activities and stretches. He had a rollator walker, which he used primarily for outdoor mobility. He had a cane that he used inconsistently in the home. He usually touched the wall or furniture as he walked from room to room. His wife helped him with the donning and doffing of the TED stockings. She also completed most of the household tasks such as cleaning and meal preparation. The faller assisted with the dishes after meals. Since 2009, a personal support worker, funded through the Community Care Access Centre, came once a week to provide assistance with showering.

Home Environment

Faller's home was over 55 years old and was designed to be compact and space efficient. The home was not designed for use of a rollator walker, and was too small for other safety aids. For example, the faller attempted to install a raised toilet seat in the bathroom, but he had to remove it when the bathroom door would not close. Due to the awkward, tight spacing, the faller did not use his rollator walker inside the home.

Communication of Health Information

The faller changed his family doctor in February, 2011. He did this to avoid driving over 20 km to a different town for medical appointments. He chose not to transfer his medical file to the new physician, as he did not want to pay the \$70 cost involved. This fee was to cover the administrative costs incurred by the initial physician's office when a file is transferred, e.g. copying supplies and staff time. The new physician was aware the faller and his wife decided not to pay the fee and did not request to have the faller's past medical records forwarded. The faller and his wife kept a notebook with medical test dates and results written in it. They felt that this information was a sufficient record of past medical treatments.

However, the faller did not report to his wife or to the doctor his blurred vision symptoms, as he had experienced the symptoms for so long that he became accustomed to them. He accepted this as the norm and managed the symptoms on his own. The new physician was not alerted to this safety concern until after the faller fell.

SFIM

Case ID: 8100112

Date: 2013-04-03

Subject #: 14801

Swiss Cheese Report

Organizational
Factors:

- The home was built in the 50's and designed to be compact with narrow halls and small doorways.
- Forwarding patient medical files to a new physician is an extra cost to a health care consumer.
- The cost to duplicate a patient's file is not billable to the Ontario Ministry of Health.

Supervision:

- Faller's wife is unaware that faller has poor proprioception in left foot compromising balance.
- New physician does not insist on full medical record being transferred.
- Physicians bill for file transfers to cover the administrative costs involved.
- Wife's written records do not include anything about the faller's episodes of blurred vision episodes.
- New physician is unaware that faller experiences episodes of unclear vision and dizziness.

Preconditions:

- The faller's house has limited space at the entrance of bedroom and bathroom.
- Using a rollator walker is difficult in small spaces.
- Faller is unaware that poor proprioception in his left foot is compromising his balance.
- The compensation methods introduced to him after his surgery have been successful in clearing his vision.
- New physician does not have the full medical history of the faller.
- Undiagnosed health issue is causing blurred vision for the faller.
- Faller has poor balance when standing.
- Faller requires increased attention to keep his balance when he stands.
- Head movements frequently cause blurred vision and dizziness for the faller.
- Blurred vision causes increased reliance on proprioception.
- Faller has decreased proprioception in his left foot.
- When vision is not clear faller has difficulty orienting himself in space.

Unsafe Acts:

- Faller leans on walls and furniture as he walks within home.
- Faller prefers to not use mobility aids consistently within the home. 2009-2012
- He does not tell his wife about the blurred vision episodes.
- Faller accepts blurred vision episodes as normal.
- Faller compensates for the blurred vision episodes by slowing down. 2010-2011
- Faller declines paying fee to have medical file transferred from old physician to new physician. Feb, 2011
- Faller expects new physician to rely on wife's written records for his medical history. Feb, 2011
- Faller is multitasking when standing and stirring.
- Faller stirs bread crumbs, moving his head up and down. 14:02
- Faller's vision becomes blurry while stirring the bread crumbs. 14:02

SFIM

Case ID: 8100112

Date: 2013-04-03

Subject #: 14801

Conclusions

The Faller was an 83-year-old gentleman who lived with his wife in a small, compact home. He fell backward in his kitchen on December 23, 2011. In 2009, he slipped on snow and fractured his left hip. He had a history of “blurred vision” when moving his head up and down, which he never mentioned to his wife.

On the day of the fall, while his wife was in the next room setting up Christmas decorations, he walked through the kitchen, without his cane or walker, to sit down at the table. Wanting to help his wife, he stopped at the counter to stir up bread cubes that were drying for Christmas turkey stuffing. While completing the task, he moved his head up and down, and his vision became blurry. He stumbled backwards and landed on the ground. He was not injured. His wife heard the noise and came into the kitchen to assist him to stand up.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

* The faller had a number of health related preconditions which contributed to the investigated fall: past left hip fracture, poor proprioception in his left foot, poor balance, as well as blurred vision associated with head movements and when standing up too fast.

* The faller’s actions and decisions also contributed to this fall: he ambulated within the small compact house without his rollator walker due to the constrained small spaces, he did not mention his episodes of blurred vision to his new doctor or his wife as the episodes were long standing, and he felt his compensation method, of not standing up too fast, was sufficient. Also, he was multitasking, when he moved his head up and down while standing and stirring bread crumbs with both of his hands occupied.

These person-related factors were linked with the following factors at the supervision and organizational levels.

* The compact, small home was unsuitable for an individual that required constant use of a rollator walker. The faller did not use walker inside home, which increased his risk for falls.

* The wife was occupied in the living room, and unable to redirect the faller from multitasking at the kitchen counter.

* Medical files were not freely shared when a patient transferred from one family physician to another. It was a common practice of doctors to charge patients a fee to have their medical files transferred. This fee covered the administrative, copying and courier cost incurred by the physician and was not billable to the Ontario Ministry of Health. The faller declined to pay the \$70 transfer cost and the new physician did not insist on having the faller’s old medical record. To mitigate this situation the faller’s wife kept a record of his medical appointments, test results, diagnosis and medications.

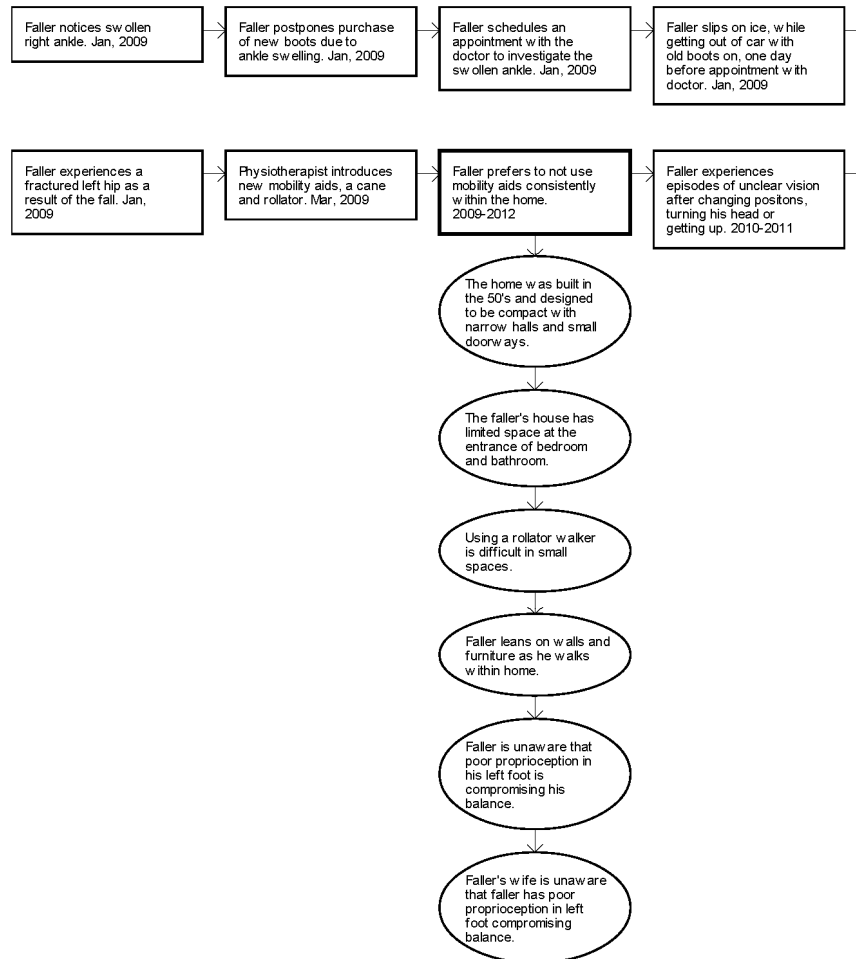
* Wife’s medical history of the faller was incomplete. The faller’s wife was unaware that her thorough note keeping of medical test and results was incomplete, as the notes had nothing about episodes of faller’s blurry vision.

* The new physician accepted the medical history kept by the wife in lieu of a medical chart from the past physician. The wife’s information was assumed to be accurate in the absence of a full medical record. Ultimately, the new physician was unaware of the need to investigate physiological issues contributing to the faller’s blurred vision.

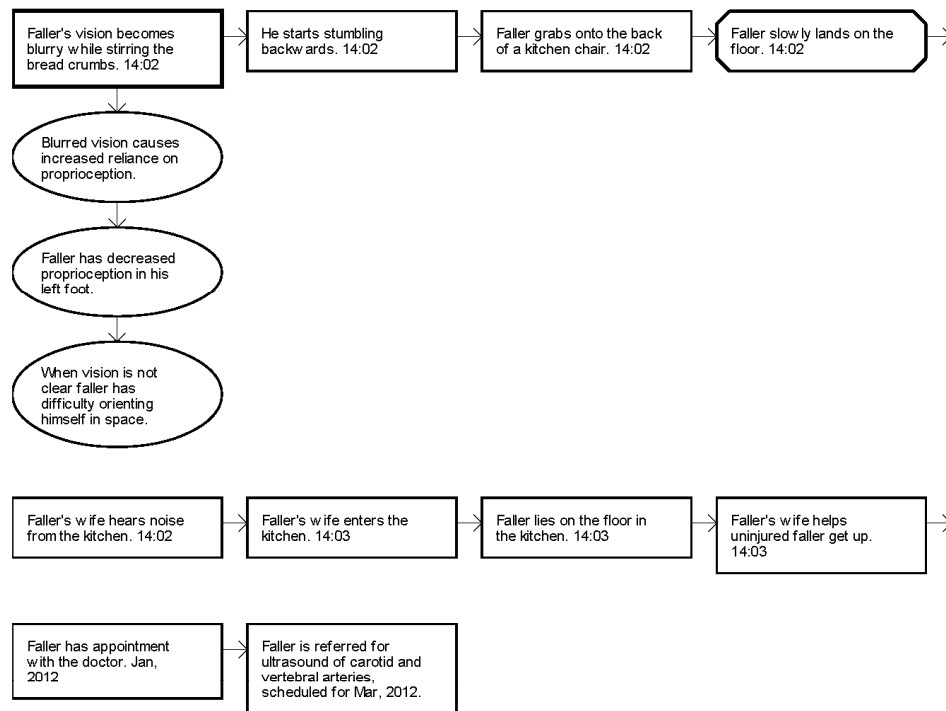
Unsafe actions and decisions combined with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to the betterment of safety for other community-dwelling older adults.



Sequence of Events: 14801







Appendix L: Mrs. Kay¹ Full SFIM Report

SFIM

Case ID: 8100212

Date: 2013-04-03

Subject #: 15522

Fall Information

2.1 Date of the fall: 2012-03-25

2.2 Day: Sunday

2.3 Time of fall: 24-hour clock

07:45

2.4 Witnesses: ☐ Un-witnessed

2.5 Location of the fall: ☐ Indoors

☐ Private Residence

☐ Living room/ Den

2.6 Activity at the time of the fall:

☐ Standing on both feet

2.6a Was this person multi-tasking? ☐ Yes

2.7 Action by the faller prior to loss of balance:

☒ Reaching to the side

2.8 Type of fall:

☐ Loss of support

2.9 Direction of the fall:

☐ Back

2.10 Environment at the fall location:

☒ Obstacle on the path (clutter, animal, carpet, threshold, assistive device, etc.)

☒ Other, please specify:

extra furniture the faller needed to reach around

2.11 Mobility aid used at the time of the fall:

☒ Walker with 4 wheels for indoor or outdoor use (rollator)

2.12 Footwear worn by the faller at the time of the fall:

☒ Bare feet

2.13 How did faller get up after the fall?

☒ Assisted by another person

☒ Family/Friend/Roommate

Please specify how the faller was assisted:

☒ Manual lift (no aide by device)

2.14 Injury? ☒ Yes

2.15 Injury severity:

☒ Moderate - required medical attention (e.g. strain, extensive bruising, laceration, bleeding, burn, chipped tooth)

2.16 Injury type:

☒ Bump on the head/concussion

2.17 Injury location:

☒ Head and neck

2.18 Type of medical attention received:

☒ ER visit only

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☒ Yes, please specify:

Faller attempted to open blinds from standing, routinely done when sitting.

SFIM

Case ID: 8100212

Date: 2013-04-03

Subject #: 15522

Information About the Faller**3.1. Demographics:**

Year of birth: 1926 Age Calculated: 86

Gender: ☐ FemalePopulation: ☒ Senior**3.2 Falls history:**☐ Rare faller (fell only this one time in the past year)**3.4 Marital status:**☐ Widowed**3.5 Mental status:**☒ Normal, alert and oriented☒ Has fear of falling**3.6 MMSE score:**☒ Not available**3.7 Education:**☐ Secondary school partial**3.8 Mobility aids:**☒ Walker with 4 wheels for indoor or outdoor use (rollator) ☐ All of the time**3.9 Other aids used by the faller:**☒ Bathroom grab bar☒ Glasses ☒ for distance ☒ for reading

☒ Rubber bathmat

☒ Shower chair

3.10 Medical problem at the time of the fall:

☒ Arthritis

☒ Osteoarthritis

☒ Blood pressure (high or low)

☒ Deconditioning

3.11 Medications:


7 _____ Number of prescription medications used by the faller on the day of the fall

   Medication Name: Fosavance _____

   Medication Name: Apo-K _____

   Medication Name: Apo-Furosemide _____

   Medication Name: Apo-Metoprolol-L _____

   Medication Name: Apo-Lorazepam _____

   Medication Name: Co-Irbesatan _____


   Medication Name: Teva-Amoxicillin _____

4 _____ Number of over-the-counter medications used by the faller on the day of the fall

   Medication Name: Vitamin B12 _____

   Medication Name: Tylenol for arthritis _____

   Medication Name: Vitamin D _____

   Medication Name: Caltrate _____

SFIM

Case ID: 8100212

Date: 2013-04-03

Subject #: 15522

Investigative Report Summary

On the morning of March 25, 2012 the 86-year-old faller fell inside her rental apartment. She reached to adjust her vertical patio door blinds, then she fell backward and hit her head on the coffee table. The evening before her fall, the faller was unable to adjust her television to a desired channel. The faller awoke on the morning of March 25, 2012, anxious to try and fix her television input. She knew that if she was unable to sort it out she could call her grandson to come over after his midnight shift and help her solve the issue.

March 25th was a Sunday, the day when the faller regularly took her Fosavance, a weekly pill that required her to stay in an upright position for half an hour after taking, due to the pill's irritating effects on the lining of the esophagus. Her usual routine was to take the pill and then shower and dress, which allowed her to remain upright. This morning, due to concerns about the television, and uncertainty if she should call her grandson, she walked over to the television first, and attempted to find her favourite channel. She was unable to get the proper input on the remote. Being a dull morning, she decided to pull open her patio window blinds. These blinds were usually opened from the seated position, but knowing that she was not going to sit down but rather have a shower she remained standing. While standing and leaning on her right leg, she reached forward, up and behind a lamp, to pull the cord that controlled the blinds. She successfully adjusted the blinds, but when she straightened up, she stumbled backward, fell and hit her head on the coffee table.

The faller was able to reach the telephone after the fall to call her grandson, informing him that she had fallen and "my TV isn't working". The grandson came to assist the faller, and he called the faller's daughter. The family took the faller to the hospital, where she was diagnosed with a concussion. The emergency department visit took less than an hour. The faller was discharged and the daughter was instructed to monitor her. Information fact sheets on how to monitor concussions were given to the family.

Faller

Faller was an 86-year-old lady who lived on her own in a building designated as a supportive housing building for seniors. She had moved to this building in June 2011 from her own home in a small rural community. She had good range of motion in her arms and legs. She had decreased strength in her right shoulder, and reported that her right knee had a tendency to "give out". Her balance was poor, necessitating the use of a rollator walker. Her cognition was generally good, but she showed signs of minor difficulty, such as difficulty managing television input buttons on the remote control.

According to her daughter, the faller was hesitant to start new things, "...but she loves it when she gets there". Initially the daughter would attend social events with the faller to introduce her to activities like bingo, movie nights and group lunches, to ease the faller's hesitation. The faller was usually independent in attending the events after the introduction.

The faller also had a fear of falling, and would not vacuum or sweep out of concern that she may fall over. The fear also affected her mobility outside the new residence. Prior to moving, the faller was confident walking outside in her small rural community, where she walked daily, if weather allowed. A year ago, when the faller moved into her apartment, she was reluctant to venture outside for fear of falling, and this substantially decreased her activity level.

Environment Set-up

When making the move from the house into an apartment, the faller found it hard to down size. She was sentimentally attached to many possessions and found it hard to leave behind some pieces of furniture. Feeling the faller had already given up a lot to make the move to a new town, the family yielded to the faller, and left a few extra pieces of furniture in the living room. The furniture set-up made accessing the patio door vertical blind pull cord awkward from a standing position. The faller accommodated for this by sitting in her recliner chair and reaching over to adjust the cord.

The vertical blinds had been in place from the previous tenant, and did not come with a user manual. The family

were under the impression that the only change that could be made, was to have the blinds reversed, by turning the entire track around. This would lead to the blinds bunching up in front of the door end of the window when pulled, which seemed more unsafe to the family than leaving the cord at the opposite end of the window. They were concerned the faller may get tangled in the blinds when going in and out through the patio door. Further investigation about vertical blinds determined that the pull cord direction can be changed allowing the cord to be accessible and the blinds still gather away from the door. Instructions were available on line.

Family Involvement and Supervision

The faller had supportive family in town. One daughter lived nearby and since she was retired, this daughter was a consistent support for the faller. She would take the faller to all her appointments, as well as grocery shopping. She was helping the faller with cleaning, laundry and general tidying. The faller had an older grandson in town. The grandson worked full time and had a young family. Her second daughter lived farther away, and was rarely available to assist.

The faller's family wanted the best for the faller. Her daughter reported "[I am] trying to keep her as safe as I can". The family also had conflicting priorities between safety and respecting the faller's wishes, and not being too paternalistic. The faller had attachment to the furniture from her previous home, so the family conceded to the faller's wishes, and tried to accommodate a few extra pieces of furniture in the living room. There was sufficient space for the faller to walk with the walker around her living room, but a small table between her recliner chair and the patio window made reaching for the vertical window blind pull cord awkward from a standing position.

When the faller was in the hospital for a week in Sept 2011, precipitated by a bladder infection, the family would come daily to walk with the faller for extra exercise. The family had the faller live with them for a month after her discharge. When the faller eventually returned home, the family made sure an electric lift chair was in place to help with sit-to-stand transfers, as the faller was weaker than she had been previously. This further contributed to the faller's deconditioning.

During the summer of 2011, the local daughter was not as actively involved in the faller's supervision because she was busy with her own family commitments. The daughter's husband was ill and undergoing treatment and their daughter was getting married. She was unable to spend as much time as she would have liked to increase the faller's confidence in her new environment. The summer was hot and humid, limiting suitable days to walk outside the apartment.

Pharmacy

A significant medication change was made on March 19, 2012. Avapro, a medication for the reduction of blood pressure, was prescribed to the faller in a different dose from what she was using at the time. The script from the prescribing physician did not specify to stop the 300 mg dose before beginning the 150 mg dose. According to the pharmacist, verbal instructions were given to the daughter for the faller to stop the 300 mg pill, and begin with the 150 mg pill. However the daughter did not recall those instructions. Hence the faller took both doses of the medication. In this situation, important instructions were not passed in written form to the faller and her caregiver. The nurse practitioner reported that the extra dose of Avapro could "absolutely" have affected the faller's blood pressure when she was standing and reaching up.

Doctors

The faller's heart specialist declined an invitation to participate in the study. His secretary reported that the doctor had a busy schedule.

An earlier report dated February 9, 2012 which the Family Health Team received from the specialist indicated that the specialist was considering prescribing Aldactone, a diuretic, for the faller. No change in Avapro was mentioned. It was not clear why the specialist changed the Avapro dose at the March 19, 2012 appointment, instead of following up with Aldactone. The faller was confident that she was managing her medication list correctly. Her daughter did not oversee the faller's medications. Currently, physicians in Ontario, Canada do not have instant access to a current drug list for their patients, and rely on the information brought to them by a patient.

Community Care Access Centre (CCAC)

The CCAC offered the faller services prior to her hospital discharge in Sept, 2011. The faller declined as she felt that since she would be staying with her family for 4 weeks, she would not require the CCAC services. When an

individual declines services from the CCAC a case manager usually gives the potential client a brochure with information about the program, but no further follow-up is completed. A family member may or may not be contacted; this decision is up to the discretion of the case manager and is dependent on each situation. CCAC case managers do have the option to put individuals on a three-month service plan for "case management services only", to allow for telephone follow-up regarding an individual's ability to manage at home. This option involved creating a file for the individual, and the individual consenting to his or her personal health information being retained for that time frame. This option is rarely used, as case managers feel busy enough with their active clients.

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[lamp at window.jpg](#)

[patio window.jpg](#)

[reaching to window.jpg](#)

SFIM

Case ID: 8100212

Date: 2013-04-03

Subject #: 15522

Swiss Cheese Report

Organizational Factors:

- The CCAC does not actively follow-up with individuals who refuse CCAC services at hospital discharge.
- When an individual declines CCAC service, the case manager does not open a file, and there is no telephone call follow-up.
- CCAC case managers are busy enough managing active cases.
- Physicians do not have electronic access to an individual's medication list.
- Pharmacy expects that the doctor has discussed and ensured the patient understands medication changes.

Supervision:

- Daughter has less time for visiting the faller to reassure her in her new home.
- Other family members live out of town, or work full-time, limiting their availability.
- Family forgets to follow-up with the CCAC for services when the faller returns home.
- Pharmacist gives verbal instructions for the medication change to the daughter.
- Daughter does not recall receiving verbal instructions from the pharmacist to stop previous dose of Avapro.
- Daughter is unaware that the faller needs to stop the 300mg dose of Avapro.
- Family is unaware that the direction the vertical blinds will pull to can be changed from one side to the other.
- The family is aware that certain spaces in the apartment are cluttered with extra furniture, but yield to the faller's desire to keep it.

Preconditions:

- Faller has a fear of falling.
- Faller's right knee unexpectedly buckles.
- Daughter has other family commitments (her husband is ill and their daughter is getting married).
- The summer is very hot, which limits suitable days for walking outside.
- Faller is already taking 300mg of Avapro.
- A February 2012 report to the family physician indicates the specialist was considering prescribing Aldactone.
- Faller is unaware that she needs to stop the 300mg dose of Avapro before starting the new 150 mg dose.
- The morning light is dull on the day of the fall.
- The faller is usually seated when opening the window blinds.
- The pull cord for the vertical blinds is at the far end of the patio door.
- The window blinds were in place when the faller moved into the apartment.
- Instructions on how to alter the pull direction of the vertical blinds were not in place.
- Excess furniture limits access to the pull cord for the blinds from a standing position.
- Faller has a sentimental attachment to her home furniture.

Unsafe Acts:

- Faller mainly stays inside the new apartment.
- After the move to new residence, the faller decreases her activity level. Jun 2011-Aug 2011
- Faller does not follow-up with CCAC services when she returns home full time after staying with family.
- Faller declines personal support services from the Community Care Access Centre (CCAC), at time of hospital discharge. Sep 2011
- Heart specialist prescribes 150 mg of Avapro. Mar 19, 2012
- Pharmacist fills the prescription for 150 mg of Avapro. Mar 19, 2012
- Faller starts taking both the 300 mg and 150 mg dose of her current medication, Avapro. Mar 19, 2012.
- Faller changes her usual routine.
- Faller decides to open the window blinds for extra light. 07:54.
- Faller leans forward and to the right while standing. 07:55
- Faller retains extra furniture in new apartment when she downsizes from a house.
- Faller reaches behind a lamp. 07:55

SFIM

Case ID: 8100212

Date: 2013-04-03

Subject #: 15522

Conclusions

The Faller, an 85-year-old living alone in a rental apartment, fell backward at approximately 7:55 on March 25, 2012. She did not have a previous history of falls, but did have a fear of falling. She was widowed and relied on her family, particularly one daughter who lived close by, to assist her with tasks around the apartment and to attend appointments with her. The fall occurred when she leaned to the right side to reach behind a lamp and access a cord that opens the vertical blinds. This was a task she usually completed from a sitting and not a standing position. When she straightened back up, she stumbled backwards and fell, hitting her head on the coffee table. She was brought to the ER and diagnosed with a mild concussion as a result of this fall.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

- * The faller had a number of health related preconditions that contributed to the fall: she was deconditioned, had decreased strength in her right shoulder, a right knee that had buckled in the past and was unreliable for weight bearing, poor balance, and a fear of falling. She showed minor cognitive changes affecting her ability to learn new tasks, and was apprehensive in new situations. She was also taking an extra dose of Avapro, a blood pressure medication (150 mg dose in addition to the original 300mg dose).

- * The faller's actions and decisions also contributed to the fall: due to sentimental attachment the faller and her family decided to retain extra living room furniture when downsizing, due to apprehension in a new environment she decreased her activity level after moving to an apartment in June 2011; after a one week stay in the hospital, precipitated by a bladder infection, she declined Community Care Access Centre (CCAC) services offered at her time of discharge in September 2011. On the day of the fall, she awkwardly leaned over to the right to reach behind a lamp to pull open vertical blinds.

These person-related factors were linked with the following factors at the supervision and organizational levels.

- * The daughter, her primary care giver, had less time to effectively reassure the faller in her new residence in the summer of 2011. The daughter's husband was ill and her own daughter was getting married. Other family members lived out of town or worked full-time, limiting opportunities for visiting and encouraging faller to increase her activity level. Also the summer was very hot, limiting outdoor mobility. The faller was reluctant to venture out on her own, and became deconditioned.

- * The CCAC was in contact with the faller in September 2011 after a hospital admission but did not open a file after a bedside consultation. The faller declined CCAC services as she decided to stay with her daughter upon discharge. She felt that she would not need the extra assistance. CCAC's standard practice is not to follow-up with an individual when services are declined; as they are busy enough managing active cases. The CCAC does have a "case management only" status, allowing for follow-up of an individual for up-to three months when no services are put into place, but this status is rarely used.

- * CCAC lacked a policy to follow-up with patients who declined services post-hospital discharge to ensure the patient's safety needs were met. The hospital CCAC Case Manager expected the patient to recall information given at the time of discharge. The faller was overwhelmed with information received close to discharge and she did not recall the CCAC information when she returned home after her one month stay with family and was experiencing difficulty with standing transfers.

- * Family addressed the faller's decrease in strength by purchasing a lift chair in October 2011. The daughter and faller did not consider physical therapy or volunteer run senior exercise groups to ameliorate physical deterioration. The lift chair compensated for the weakness and difficulty with standing transfers but contributed to further decline of strength.

- * Family assumed they had all necessary information on vertical blinds. The vertical blind pull cord was positioned at the side of the window blocked by a side table and lamp when faller moved into apartment in June 2011. The family chose to keep the pull cord's position, assuming that if the position was changed the blinds would gather in

front of the patio door and become a hazard. The family was unaware of the option of changing the pull cord direction without changing position of the blinds. The manufacturer instructions for the vertical blinds were not available from the previous tenant, but directions for changing the cord position were available online.

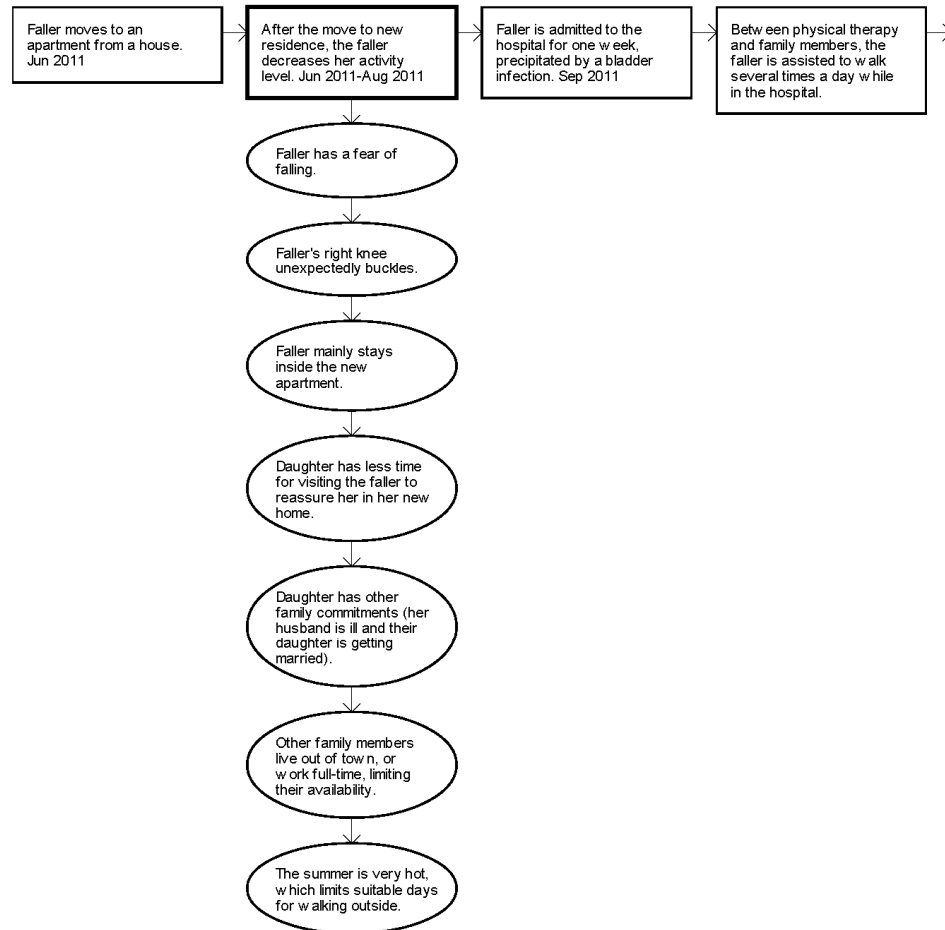
* Family yielded to the faller's desire to retain her possessions from previous home. Extra furniture limited the faller's access to the pull cord for the vertical blinds that was left in place from the previous tenant.

* The pharmacy's policy was to give only verbal instructions for a medication change. The pharmacy assumed the doctor had discussed and ensured the faller understood the medication change. The faller's daughter did not recall receiving the verbal instructions from the pharmacist or from the prescribing doctor for the faller to stop the one dosage of Avapro before beginning the new dose. The faller was unaware she should stop the initial dose of Avapro, and ended up taking an extra dose (300 mg plus 150 mg) of this blood pressure medication starting on March 19, 2012. This would have affected her blood pressure when she was standing and reaching.

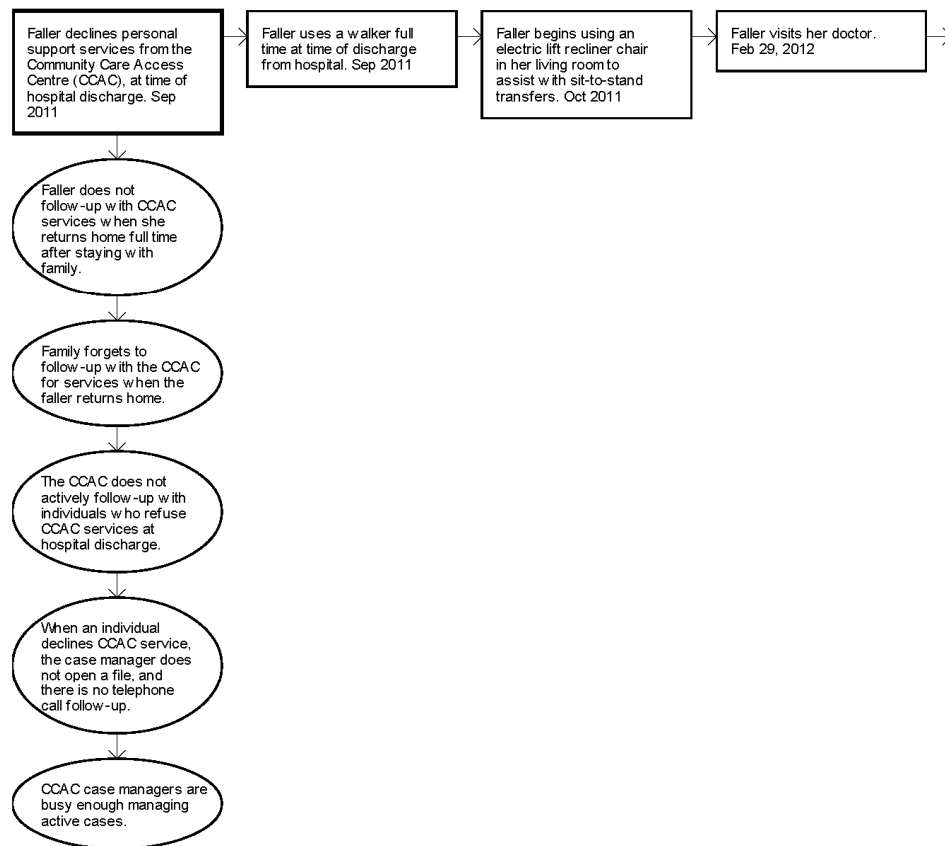
Unsafe actions and decisions combined with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.

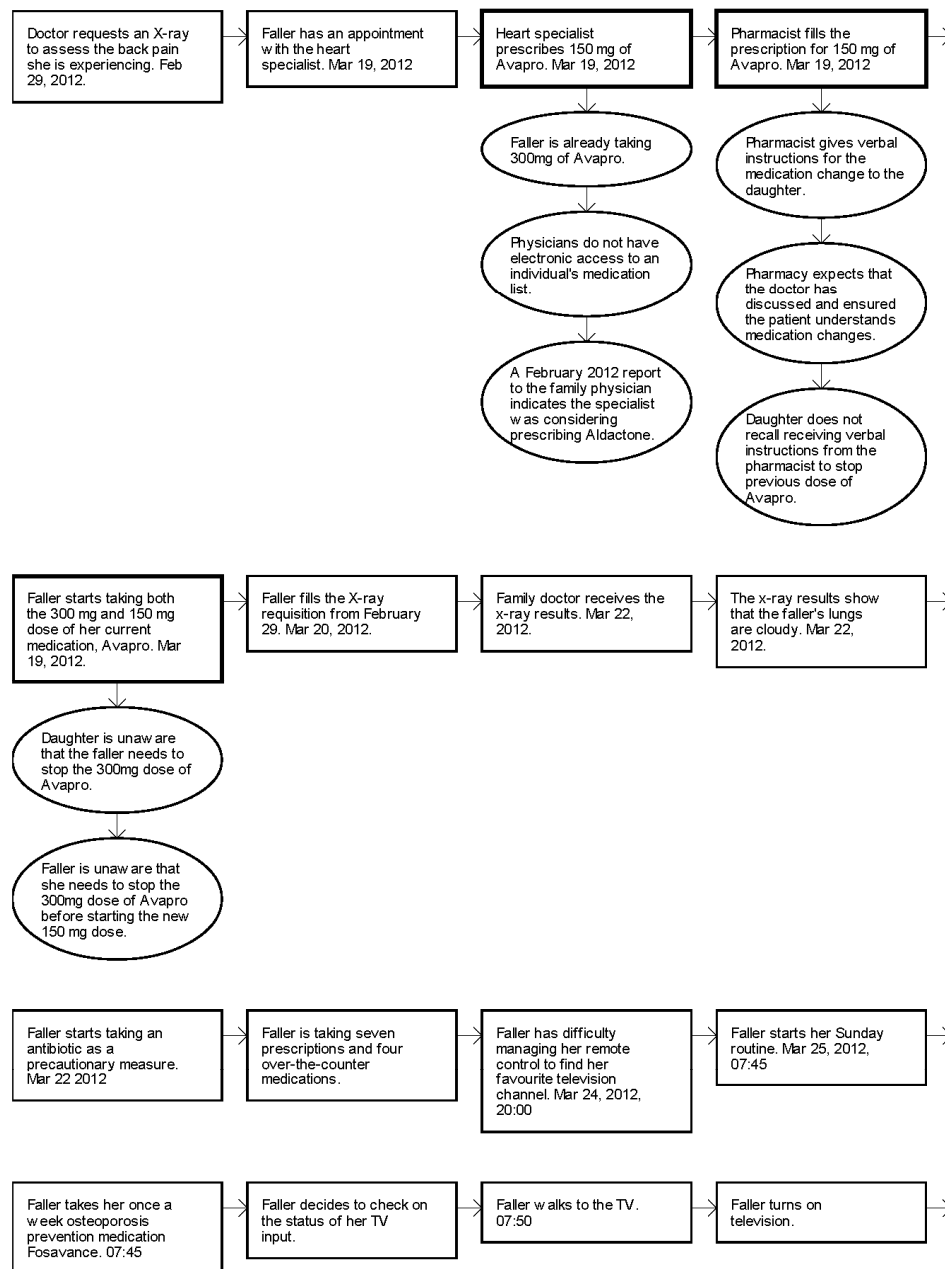


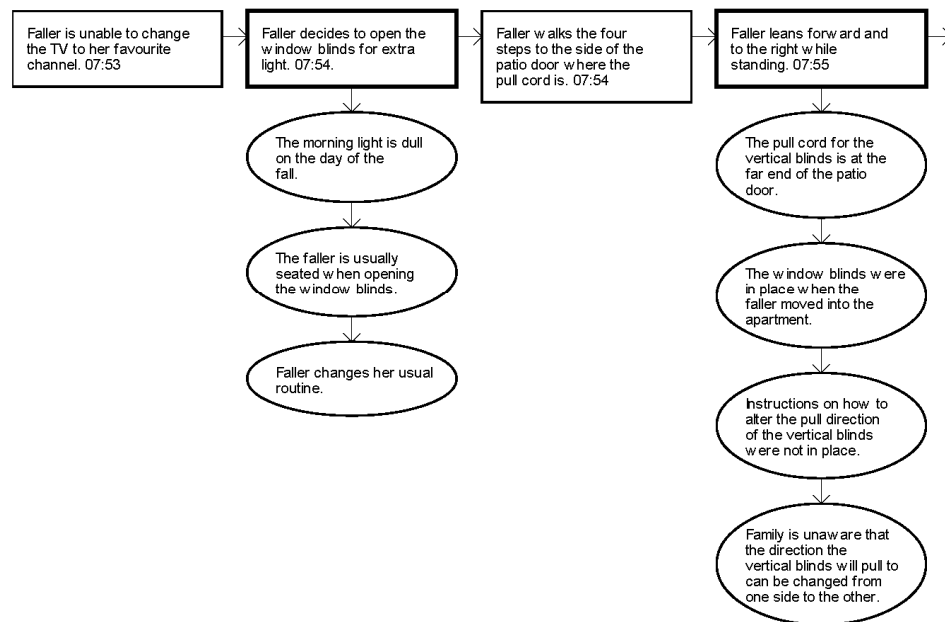
Sequence of Events: 15522

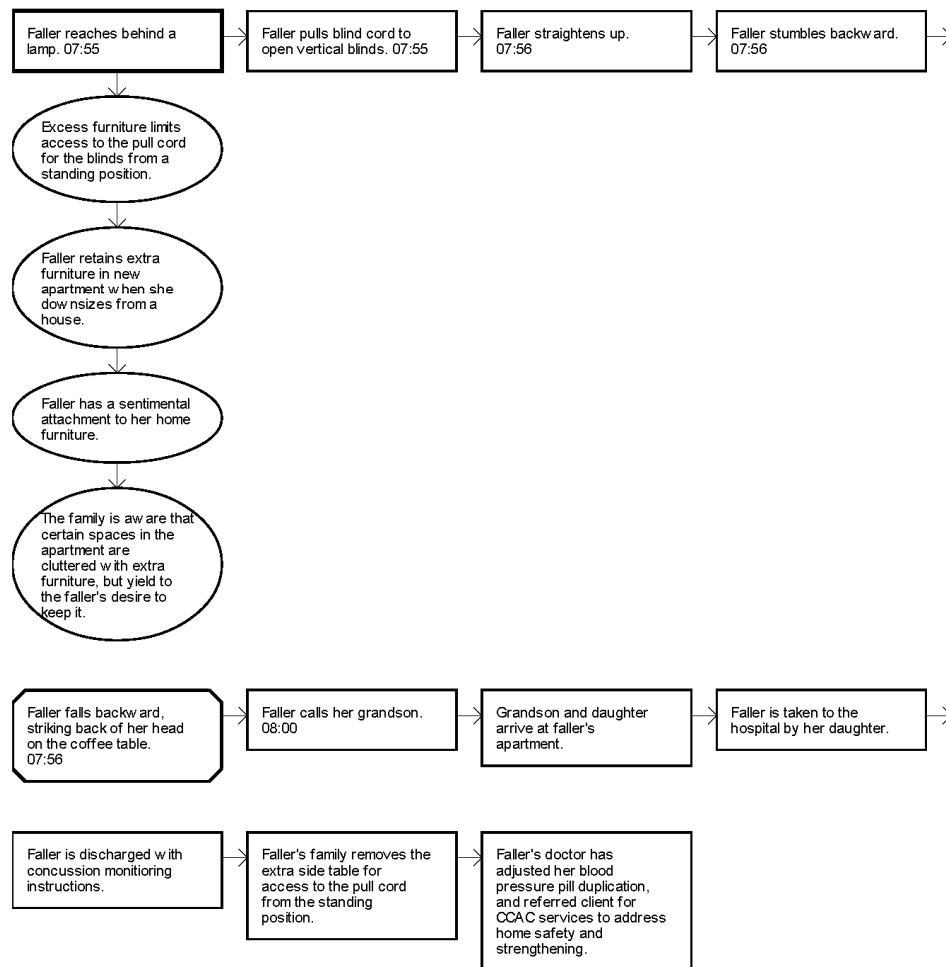


15522 1/5









Appendix M: Mrs. Kay² Full SFIM Report

SFIM

Case ID: 8100312

Date: 2013-04-03

Subject #: 15523

Fall Information

2.1 Date of the fall: 2012-04-012.2 Day: Sunday

2.3 Time of fall: 24-hour clock

00:202.4 Witnesses: ☐ Un-witnessed2.5 Location of the fall: ☐ Indoors☐ Private Residence☐ Bedroom

2.6 Activity at the time of the fall:

☐ Standing on both feet2.6a Was this person multi-tasking? ☐ Yes

2.7 Action by the faller prior to loss of balance:

☒ Reaching to the side☒ Other, please specify:Opening window.

2.8 Type of fall:

☐ Over - reach

2.9 Direction of the fall:

☒ Sideways left

2.10 Environment at the fall location:

☒ Poor lighting or darkness

☒ Other, please specify:

Window latch and pull handle were 60 inches high.

2.11 Mobility aid used at the time of the fall:

☒ None

2.12 Footwear worn by the faller at the time of the fall:

☒ Bare feet

2.13 How did faller get up after the fall?

☒ Assisted by another person

☒ Family/Friend/Roommate

Please specify how the faller was assisted:

☒ Manual lift (no aide by device)

2.14 Injury? ☒ Yes

2.15 Injury severity:

☒ Moderate - required medical attention (e.g. strain, extensive bruising, laceration, bleeding, burn, chipped tooth)

2.16 Injury type:

☒ Sprain/strain/dislocation

2.17 Injury location:

☒ Lower back

☒ Leg, knee, foot, toe(s) ☐ Right

2.18 Type of medical attention received:

☒ Admitted to hospital for one or more days

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No

SFIM

Case ID: 8100312

Date: 2013-04-03

Subject #: 15523

Information About the Faller**3.1. Demographics:**Year of birth: 1926 Age Calculated: 86Gender: ☒ FemalePopulation: ☒ Senior**3.2 Falls history:**☒ Occasional faller (fell more than once in the past year)**3.3 To get an idea of the frequency with which this person falls, please answer the following questions:****a) Falls frequency**Number of falls in the last week: 3Number of falls in the last month: 3Number of falls in the last year: 3**b) Loss of balance frequency** - Number of near falls (sudden or uncontrollable losses of balance without landing):☒ Unknown**3.4 Marital status:**☒ Widowed**3.5 Mental status:**☒ Normal, alert and oriented☒ Has fear of falling**3.6 MMSE score:**☒ Not available**3.7 Education:**☒ Secondary school partial

3.8 Mobility aids:

☒ Walker with 4 wheels for indoor or outdoor use (rollator) ☒ All of the time

3.9 Other aids used by the faller:

☒ Bathroom grab bar

☒ Glasses ☒ for distance ☒ for reading

☒ Rubber bathmat

☒ Shower chair

3.10 Medical problem at the time of the fall:

☒ Arthritis ☒ Osteoarthritis

☒ Blood pressure (high or low)

☒ Deconditioning

3.11 Medications:

7 _____ Number of prescription medications used by the faller on the day of the fall

☒ Medication Name: Fosavance

☒ Medication Name: Apo-K

☒ Medication Name: Apo-Furosemide

☒ Medication Name: Apo-Metoprolol-L

☒ Medication Name: Apo-Lorazepam

☒ Medication Name: Co-Irbesatan (Avapro)

☒ Medication Name: Teva-Amoxicillin

4 _____ Number of over-the-counter medications used by the faller on the day of the fall

☒ Medication Name: Vitamin B12

☒ Medication Name: Tylenol for arthritis

☒ Medication Name: Vitamin D

☒ Medication Name: Caltrate

SFIM

Case ID: 8100312

Date: 2013-04-03

Subject #: 15523

Investigative Report Summary

In the middle of the night between March 31st and April 1st the faller fell inside her rental apartment, while opening a window in an attempt to cool down her bedroom. On the eve of March 31st, 2012 the faller felt tired and went to bed early. In the middle of the night she awoke feeling hot. She did not have the ability to control the heat in her apartment, and therefore the only way to cool down the bedroom was to open the window. She transferred safely out of her bed and walked to the window. In an attempt to open the bedroom window she lost balance, fell sideways to the left and landed on the floor. After the fall, she pressed her Lifeline button for assistance. Her daughter and son-in-law came over to assist her up. The family were able to assist the faller to stand, but she had difficulty walking. The faller's right leg kept "buckling". She was taken to the ER by an ambulance, and was admitted to the hospital for rehabilitation and medical investigation.

Faller

Faller was an 86-year-old widow who lived in a building designated as a supportive housing building for seniors. She moved to this building in June 2011 from her own home in a small rural community. She had good range of motion in her arms and legs, but had decreased strength in her right shoulder, and reported that her right knee had a tendency to "give out". Her balance was poor, necessitating the use of a rollator walker. Her cognition was generally good, but she showed signs of minor difficulty such as managing her television input buttons on the remote control. For safety, the faller subscribed to Lifeline. Lifeline provided a pendant she could press if she required emergency assistance and was unable to reach a phone.

The faller had supportive family caregivers in town. One of her daughters was retired and was a consistent support. She would take the faller to all appointments, to get groceries, and was helping the faller with cleaning, laundry and general tidying. The faller also had a grandson in town. The grandson worked full time and had a young family. The faller's second daughter lived out of town, and was not as available to assist.

According to her daughter the faller was hesitant to start new things, "...but she loves it when she gets there". The daughter would usually initially attend activities like bingo, movie night and group lunches to ease the faller's hesitation. After an introduction, the faller was usually at ease and independent in attending these events.

The faller also had a fear of falling, and would not vacuum or sweep out of concern that she may fall over. This fear also affected her mobility outside of her new residence. Prior to moving into the new residence, the faller was confident walking outside in her small community, and she walked almost daily, as weather allowed. When the faller moved into the new apartment, she was reluctant to venture outside for fear of falling, which decreased her activity level.

The faller experienced two falls on March 25, 2012. On March 19, 2012 her blood pressure medication was inadvertently increased when the initial dose of the medication was not stopped as a new dose was introduced. This increase meant the faller was taking an additional 150 mg of Avapro with her current dose of 300mg. This was corrected on March 27, 2012, when the additional 150 mg dose was stopped.

Family

The family had the best interests of the faller in mind. When the faller was in the hospital for a week in Sept 2011, precipitated by a bladder infection, the family would visit daily and walk with the faller for extra exercise. When the faller eventually returned home in October, the family made sure an electric lift chair was in place to help her with sit-to-stand transfers, as the faller was weaker than she had been previously.

However, during the previous summer, the caregiver daughter was busy with her own family commitments and was unable to spend as much time as she would have liked to help increase her mother's confidence in her new environment. In addition, the summer was hot and humid, limiting suitable days for outdoor walks. This decreased activity contributed to the faller's deconditioning.

After the faller's two falls on March 25th, the daughter planned to help her mother attend the volunteer-run weekly exercise class that took place in the common room of the faller's apartment building. The faller

experienced this third fall before the daughter had an opportunity to follow-up with the exercise group.

Community Care Access Centre (CCAC)

When the faller was admitted to the hospital with a bladder infection in Sept, 2011 the CCAC offered the faller support services at the time of her discharge. The faller declined services at that time, as she felt that since she would be staying with her family for the first month, she would not require the CCAC services. When an individual declines services from the CCAC, no further follow-up is completed. CCAC case managers have an option to put individuals on a three-month service plan for "case management only", to allow for a follow-up telephone call to ensure an individual's needs are met. This service plan was not put in place for the faller. This option is rarely utilized, as case managers feel busy enough with their current caseloads.

After two falls on March 25th, CCAC services were proposed by the nurse practitioner at the Family Health Team on March 27, and the faller accepted. The intake CCAC case manager arranged for occupational therapy and physical therapy services, but not for personal support worker (PSW) services. A PSW assists with tasks such as bathing, dressing, or medication management. The faller's family did not feel that the CCAC was open to offering this service and were frustrated by the situation. The daughter commented "...when you talk to people from CCAC, they question you whether she really [needs the service]--I sometimes feel like I am wasting their time, but I think no, she needs help--but they have to come out and see... [if the faller is eligible for personal support services]". PSW services had not been implemented before the faller went to the hospital in the early hours of April 1, 2012.

Supportive Housing Designation

The Local Health Integration Network (LHIN) for the region distributed a portion of their funds from the Aging at Home Strategy into supportive housing programs. The supportive housing program allows for increased personal support services for eligible seniors living in these residences. The faller's building was chosen by the LHIN to be a supportive housing building as it was close to the shopping mall and a grocery store, and housed a large number of senior residents.

Though the building was a naturally occurring retirement community, the building itself had several features that were not senior friendly. The windows in this building were too high for seniors. The PSW agency reported that most of the seniors under their care were unable to open or close the bedroom windows independently. The faller's daughter also commented on how difficult it was to open the window, and that she often adjusted it for the faller. The window sill was 48 inches from the floor and the window required two hands to open; one hand to undo and hold a latch and the other hand to simultaneously pull the window pane open. The height of the window necessitated that an individual of average height needed to hold both arms well over shoulder height for a prolonged period of time while applying force to the side of the window pane.

Other structural issues identified as problematic in this apartment building included narrow bathroom doors, not allowing the majority of rollator walkers to enter into the bathroom, and blocked access to the balcony by a baseboard heater, limiting access for individuals with a mobility device. The landlord has widened the bathroom door for wheelchair users in several units, but moving the baseboards to allow for balcony access was not an option. The building was chosen by the LHIN for the supportive housing program based on the high population of seniors already living in the building, but the apartments were not senior friendly in their design. The faller chose to move to this building based on this supportive housing designation. She assumed she would be able to age-in-place safely.

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SFIM

Case ID: 8100312

Date: 2013-04-03

Subject #: 15523

Swiss Cheese Report

Organizational
Factors:

- When an individual declines CCAC service at the time of hospital discharge, the case manager does not open a file, and there is no telephone call follow-up.
- The CCAC practice is not to actively follow-up with individuals post-hospital discharge.
- CCAC case managers are busy enough managing cases with active services.
- CCAC case manager expected faller to remember information given at time of hospital discharge.
- Community programs and services for increasing senior safety and preventing deterioration are not evident to faller and her family.
- Physicians do not have electronic access to a patient's medication list.
- Pharmacy expects that the doctor has discussed and ensured the patient understands medication changes.
- The building is designated as supportive housing due to the naturally occurring retirement community, not for the building's senior friendly qualities.
- The LHIN designated building with questionable age in place design features for supportive housing program.

Supervision:

- Daughter has less time available to reassure the faller in her new apartment.
- Other family members live out of town, or work full-time, limiting their availability.
- Family forget to follow up with CCAC for services when returning faller to her apartment.
- Daughter does not recall receiving verbal instructions from the pharmacist to stop previous dose of Avapro.
- Daughter is unaware that the faller needs to stop the 300mg dose of Avapro.

Preconditions:

- Faller has a fear of falling.
- Faller's right knee unexpectedly buckles.
- Daughter's husband is ill and their daughter is getting married.
- The summer is very hot, which limits opportunities for outdoor walking.
- Faller is overwhelmed with information at time of hospital discharge.
- Faller is deconditioned.
- Faller and family are unaware of need for faller to participate in a formal exercise program to prevent deterioration and increase strength for sit- to-stand transfers.
- Faller is already taking 300 mg of Avapro.
- A February 2012 report to the family physician indicates the specialist was considering prescribing Aldactone.
- Faller is unaware that she needs to stop the 300mg dose of Avapro before starting the new 150 mg dose.
- The extra dose of Avapro will decrease the faller's ability to regulate her blood pressure.
- Faller had two previous falls this week after she raised her arms and reached.
- Faller has decreased strength in her right shoulder.
- The window is 48 inches at its lowest point.
- The faller has to reach well over shoulder height to open window.

- The window latch design requires use of both hands to open.
- Faller's apartment unit has features that are inadequate for seniors with health problems.
- There is no thermostat to regulate the temperature in the apartment.
- Faller needs to open the bedroom window to cool the room down.
- Faller needs to multi-task to open the window.
- Faller has poor balance.

Unsafe Acts:

- After the move to new residence the faller decreases her activity level. Jun, 2011 - Mar, 2012.
- Faller declines personal support services from the CCAC at time of hospital discharge. Sep, 2011
- Faller forgets to follow up with CCAC services when she returns home after staying with her family for a month.
- Faller returns home. Oct, 2011
- Faller starts using an electric lift recliner chair in her living room to assist with sit-to-stand transfers. Oct, 2011
- Heart specialist prescribes 150 mg of Avapro. Mar 19, 2012.
- Pharmacist gives verbal instructions for the medication change to the daughter.
- Pharmacist fills the prescription for 150 mg of Avapro. Mar 19, 2012
- Faller begins the 150 mg of Avapro in addition to her 300mg prescription. Mar 19, 2012
- Faller reaches up with both arms. 00:16
- Faller grasps the window with both hands. 00:16
- Faller attempts to pull the window pane to the left. 00:17

SFIM

Case ID: 8100312

Date: 2013-04-03

Subject #: 15523

Conclusions

The Faller, an 85-year-old lady, fell just after midnight on April 1, 2012. She lived alone in a rental apartment in a building designated as a supportive housing building by the Local Health Integration Network (LHIN). The faller was widowed and relied on her family, particularly one daughter who lived in town, to assist her with household tasks and to attend all appointments. This was the faller's third fall in one week.

On the night of the fall, the faller was hot, so she got out of bed to open the bedroom window and cool the bedroom down. She reached to the right and up over shoulder level, lost her balance and fell to the left side. She was unable to get up on her own and she pressed Lifeline. Her daughter and son-in-law came to assist. The faller had difficulty standing and was unable to walk with help. Daughter called an ambulance, and the faller was admitted to the hospital for further investigation.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

- * The faller had a number of health related issues which contributed to the fall: she was deconditioned, had decreased muscle strength in her right shoulder, poor balance, a fear of falling and her right knee was unreliable. She showed minor cognitive changes affecting her ability to learn new tasks, and was apprehensive in new situations. She had two falls in the same week (both on March 25th) and suffered a minor concussion after the first fall. On March 19th she was prescribed and started taking an additional dose of Avapro, a blood pressure medication (total dose of 450mg). On March 27th the mistake was discovered by her nurse practitioner and the dose was reduced to 300mg.

- * The faller's actions and decisions also contributed to the fall: she decreased her activity level after moving to a new apartment in June, 2011 because she was apprehensive in her new environment; she declined Community Care Access Centre (CCAC) services offered in September, 2011 when she was discharged from a one week stay in the hospital, precipitated by a bladder infection; and on the day of the fall she over-reached up and to the side with both arms to pull open a window.

- * The environment contributed to the fall: the bedroom windows were high, 48 inches to the window sill, and another 12 inches to the latch and pull handle. The latches required both hands to open the window, one to hold the latch down and the other to pull on the window. The apartments did not have individual thermostats, requiring the faller to open the windows when bedroom was too warm. Many seniors in the building relied on the assistance of personal support workers (PSWs) or family caregivers to open and close the bedroom window.

These person-related and environmental factors were linked with the following factors at the supervision and organizational levels.

- * The daughter who was the primary caregiver had less time to help the faller in the summer of 2011. The daughter was unable to effectively reassure the faller in her new environment and encourage increased activity because the daughter's husband was ill and her own daughter was getting married. The summer was very hot, limiting opportunities for outdoor mobility. Other family members lived out of town or worked full-time, limiting opportunities for visiting and improving the faller's activity level. The faller was reluctant to venture out on her own, and became deconditioned.

- * CCAC lacked a policy to follow-up with a patient who declined services post-hospital discharge to ensure an individual's safety needs are met. The CCAC was in contact with the faller in September 2011 after a hospital admission but did not open a file after a bedside consultation. The faller declined CCAC services as she decided to stay with her daughter upon discharge and felt that she would not need the extra assistance. CCAC's practice was to not follow-up with individuals who declined services, as they are busy enough managing active cases. The CCAC does have a "case management only" status, allowing for follow-up of an individual for up-to three months when no services are put into place, but this status was rarely used. It was expected that patients recall information given at the time of hospital discharge and call the CCAC if services were needed. The faller was overwhelmed

with information received close to discharge and she did not recall the CCAC instruction to call if she had difficulties when she returns home after one month stay with family. The faller forgot to call for assistance, even when she experienced difficulty with standing transfers.

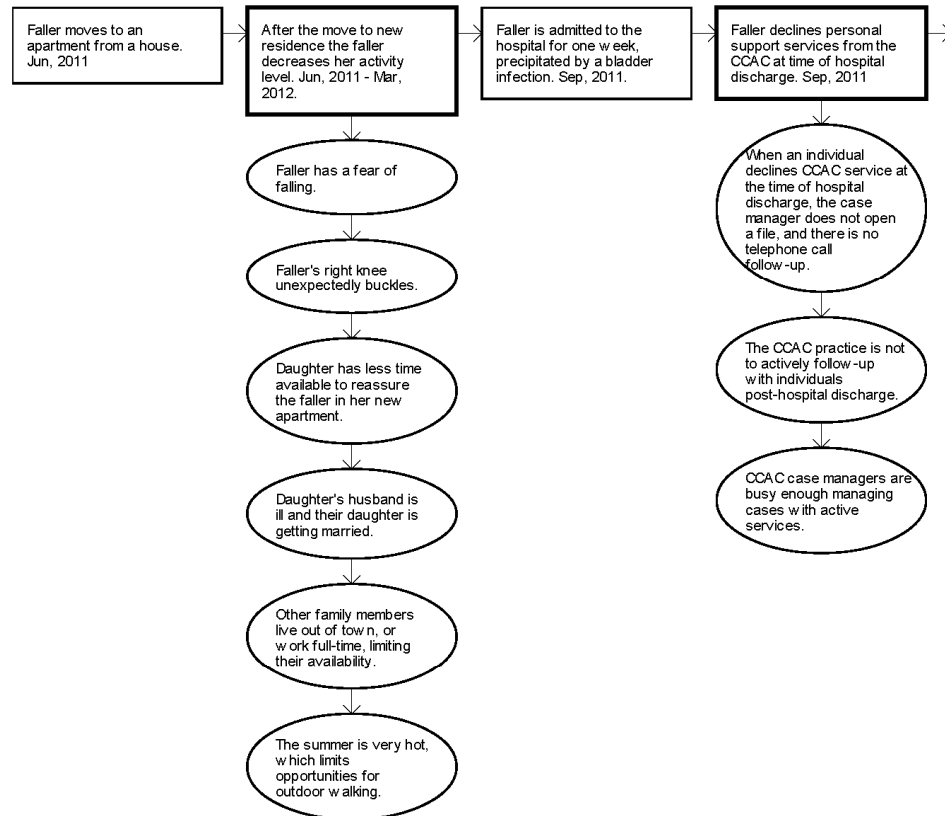
* The daughter and faller did not consider physical therapy or volunteer run senior exercise groups to ameliorate physical deterioration. Family addressed the faller's decrease in strength by purchasing a lift chair in October 2011. The lift chair compensated for the weakness but contributed to further decline of strength.

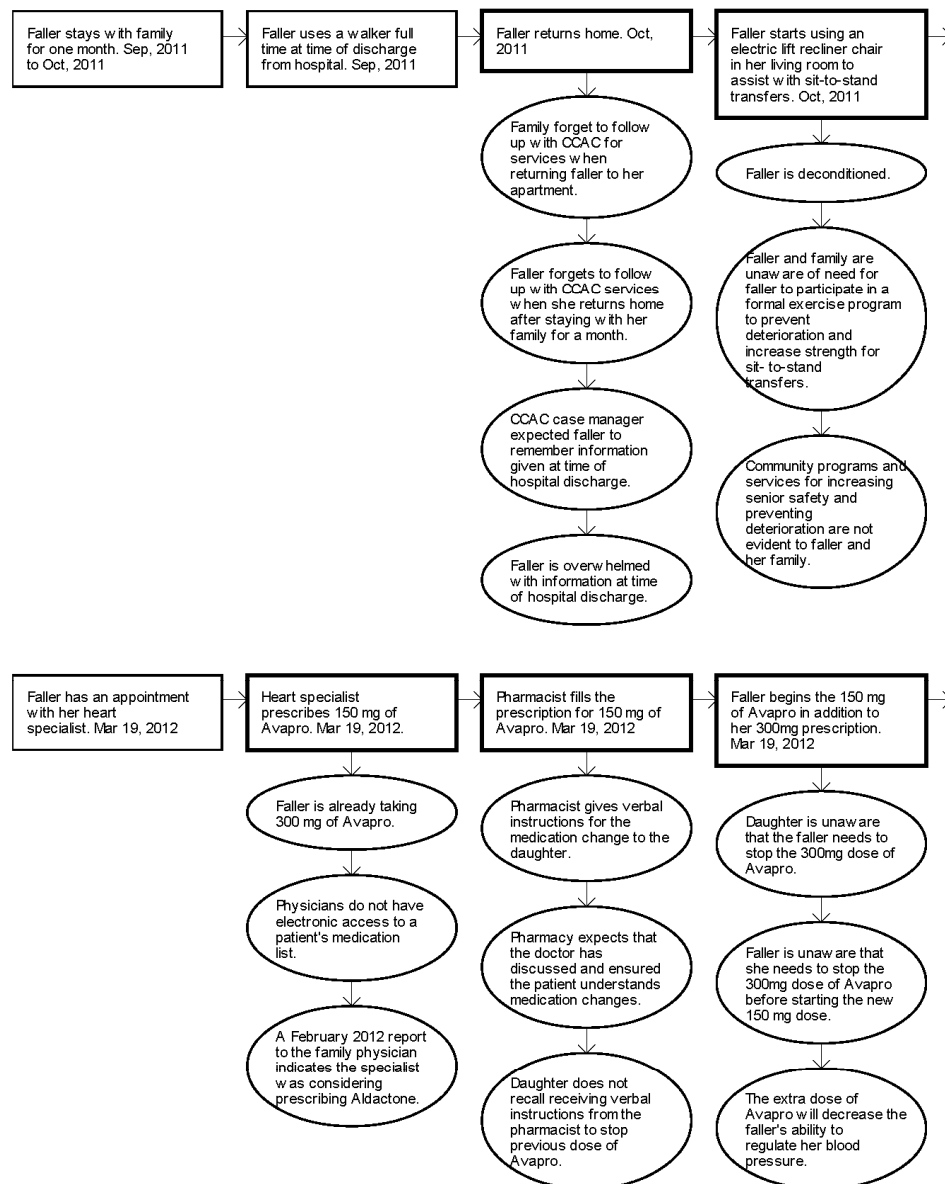
* The Local Health Integration Network (LHIN) gave the distinction of "supportive housing building" to the building where the faller lived based on the large number of seniors already living there. The supportive housing program allows for extra funded services to eligible seniors. The faller specifically moved to this building because of the building's supportive housing designation. However the building had some features that were inadequate for the needs of seniors, i.e., high windows, narrow bathroom door, baseboard heater in front of patio door.

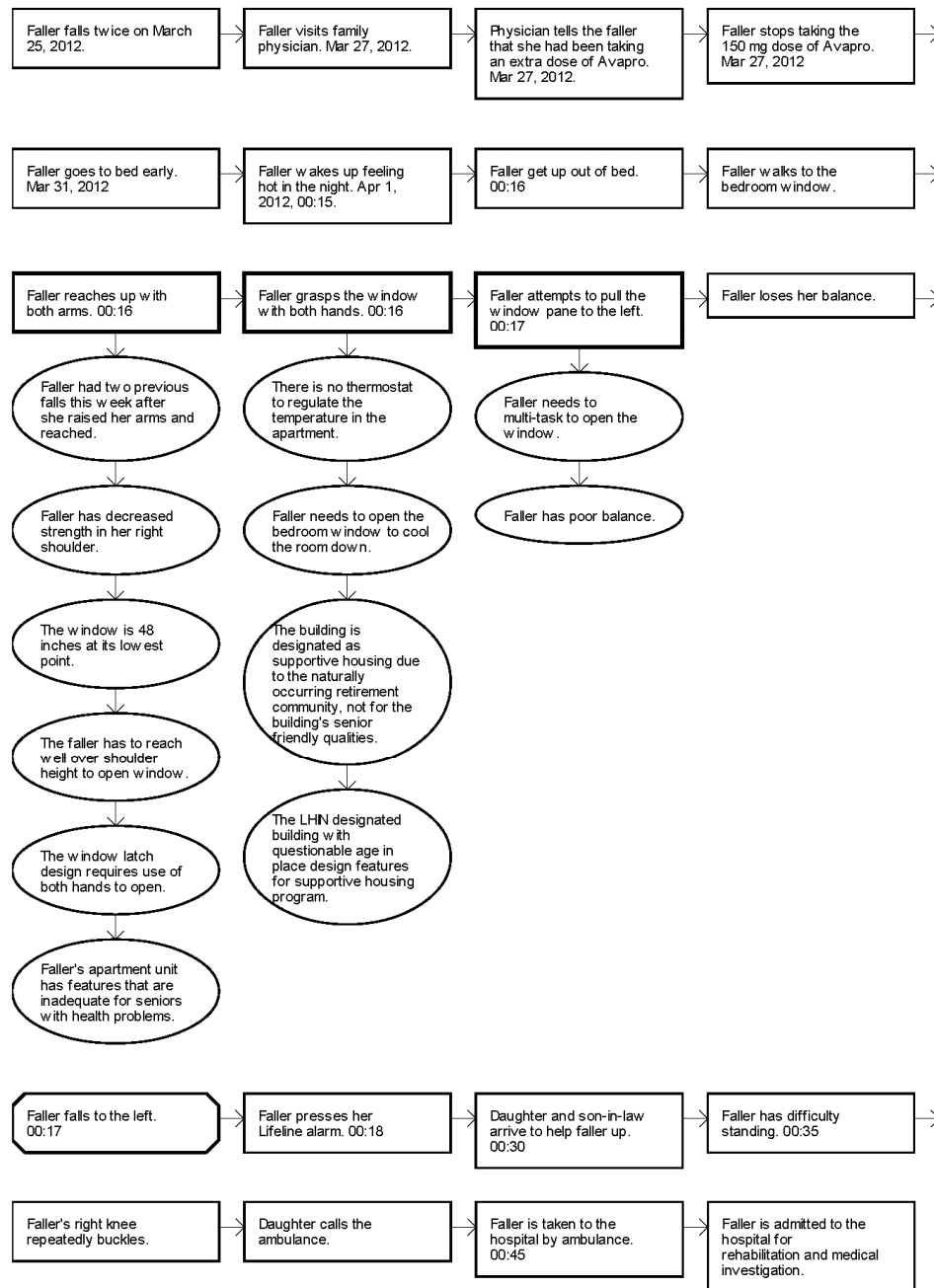
* The CCAC intake case manager (CM) delayed putting PSW assistance in place after the faller's initial two fall incidents earlier in the week, even though the daughter had reported to the intake CM that her mother required assistance and was at risk for further falls. Some CM's practice was to delay PSW initiation until the OT and the community CM completed assessments to confirm what level of assistance was required, as some CCAC clients feel that they are entitled to PSW hours once they have been initiated, making it difficult to decrease services levels once started.

Unsafe actions and decisions combined with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.

Sequence of Events: 15523







Appendix N: Mrs. Bridge full SFIM report

SFIM

Case ID: 8100412

Date: 2013-04-03

Subject #: 15524

Fall Information

2.1 Date of the fall: 2012-03-282.2 Day: Wednesday

2.3 Time of fall: 24-hour clock

10:002.4 Witnesses: ☐ Un-witnessed2.5 Location of the fall: ☐ Indoors☐ Private Residence☐ Entrance/ doorway (to rooms, buildings, apartments)

2.6 Activity at the time of the fall:

☐ Walking2.6a Was this person multi-tasking? ☐ Unknown

2.7 Action by the faller prior to loss of balance:

☒ Turning

2.8 Type of fall:

☐ UnknownLikely a stumble or trip.

2.9 Direction of the fall:

☒ Sideways right

2.10 Environment at the fall location:

☒ Other, please specify:

carpeted floor

2.11 Mobility aid used at the time of the fall:

☒ None

2.12 Footwear worn by the faller at the time of the fall:

☒ Bare feet

2.13 How did faller get up after the fall?

☒ Assisted by another person

☒ EMS

Please specify how the faller was assisted:

☒ Manual lift (no aide by device)

2.14 Injury? ☒ Yes

2.15 Injury severity:

☒ Serious - required substantial medical attention (e.g. sprain, fracture, joint dislocation, head injury, loss of consciousness, open wounds, internal injuries)

2.16 Injury type:

☒ Fracture

2.17 Injury location:

☒ Hip ☐ Right

2.18 Type of medical attention received:

☒ Admitted to hospital for one or more days

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No

SFIM

Case ID: 8100412

Date: 2013-04-03

Subject #: 15524

Information About the Faller**3.1. Demographics:**Year of birth: 1922 Age Calculated: 90Gender: ☒ FemalePopulation: ☒ Senior☒ Cognitive impairment**3.2 Falls history:**☒ Occasional faller (fell more than once in the past year)**3.3 To get an idea of the frequency with which this person falls, please answer the following questions:****a) Falls frequency**Number of falls in the last week: 0Number of falls in the last month: 0Number of falls in the last year: 3**b) Loss of balance frequency - Number of near falls (sudden or uncontrollable losses of balance without landing):**☒ Unknown**3.4 Marital status:**☒ Widowed**3.5 Mental status:**☒ Diagnosed with dementia**3.6 MMSE score:**14**3.7 Education:**☒ Secondary school completed**3.8 Mobility aids:**

☒ None

3.9 Other aids used by the faller:

☒ Glasses ☒ for distance ☒ for reading

3.10 Medical problem at the time of the fall:

☒ Blood pressure (high or low)

☒ High Cholesterol

3.11 Medications:

4 Number of prescription medications used by the faller on the day of the fall

   Medication Name: Alendronate-Fosamax

   Medication Name: Atorvastatin

   Medication Name: Ramipril

   Medication Name: Aspirin

0 Number of over-the-counter medications used by the faller on the day of the fall

SFIM

Case ID: 8100412

Date: 2013-04-03

Subject #: 15524

Investigative Report Summary

On March 28, 2012, at 10:00 am, the faller fell inside her home at the front door, fracturing her right hip. Her nephew found her when he came to pick her up for a dental appointment. She reported that she had gone outside to check her flowers and fell when she came back into the house. When she landed, she fractured her right hip, and required a partial hip replacement.

Faller

Faller was a 90-year-old lady who lived on her own. She was showing signs of cognitive impairment, such as arriving a day early or late for functions, having a disheveled appearance and having decreased success when playing cards. Post fall, her Mini Mental State Examination score was 14/30. In 2002 she scored 25/30 on the same test, completed as part of a geriatric assessment. The geriatric assessment indicated the faller had a possible mild cognitive impairment and recommended three month follow-up to monitor faller's weight and re-assess cognition. Physically, she had good range of motion and strength. She did not use a mobility aid, though she would reportedly hold onto objects in the environment for support and she had a history of falls indicating impaired balance. Faller was an active member in a local service club, and played bridge weekly with a consistent group of friends. Seven weeks prior to her fall, the faller had dental work completed which removed her remaining five teeth. Her dental plate no longer fit after the surgery, so she was only able to eat soft foods.

The faller reportedly had a laissez-faire attitude to life, and did not get concerned about situations that others considered distressing. According to the faller's girlfriend, the faller "never abided by the rules, she made her own rules", she "agreed with everything, but did what she wanted". Her friend described a time when the faller chose not to renew her driver's license, as she did not think she would pass the test that was required for individuals over 85 years of age, but the faller still continued to drive for a short time with an invalid license. Her friend's daughter helped install a new phone in 2010 and noted that the phone cord wiring was frayed and damaged. The faller told her not to worry, that it was OK, and to just plug it in. When the faller's roof started leaking in 2008, she set up pails inside the house, but did not instigate repairs. It was her friends that contacted her landlord to organize the repairs. The faller was a very independent, active, "on the go" lady, and was apparently stubborn. "If you told her she needed something, she wouldn't do it", reported her girlfriend.

The faller also appeared to lack insight into her personal safety. She visited her doctor on an inconsistent basis and declined medical suggestions, frequently skipping her prescribed medications. Her nephew reported that when he was cleaning her home, after she went to the hospital, he found a whole bag of unopened medications in blister packs. The faller once brought a brick of cheese that was black with mold to a social gathering, unaware of the safety risk until pointed out by her friends. For bridge games, the faller would at times wear sandals with no socks in the winter. She displayed poor hygiene, such as uncut toe nails, and at times a dirty face and unkempt clothing. The faller's persuasive verbal skills masked her cognitive decline. For example, when her nephew asked where her boots or her winter coat were, she would say "oh, I don't want to wear those clunky things" or "it's not cold out". According to her girlfriend, the faller had a way of "fooling" those around her to hide her cognitive weaknesses. Her friend reported, "When you talk to her...she can really fool you...she really can...even myself sometimes, and I knew her". Her friend noted that the behaviour changes had become more evident over the past winter, 2011-2012.

Support Systems

Friends

Faller's friends noted her cognitive issues and were concerned, but did not know where to turn for assistance. They tried to help her out and offer suggestions, but she was a very independent lady, and would often refuse help; e.g. her friend offered to pay for Lifeline, which the faller declined. Faller did allow a friend to take her grocery shopping weekly, and would buy much more than she needed. Her friends felt powerless. One friend stated: "What could you do?...we talked about it all the time...there was no one to take responsibility you know". In the winter of

2011, this friend was able to contact the faller's nephew to arrange for him to drive the faller to the weekly bridge game, when the friend was no longer able to drive the faller herself.

Nephew

The faller had no children of her own. Her closest relatives were a niece who had her own health issues and was unable to assist, and a nephew who lived in town, but was not a blood relation. The faller did not initially see this nephew as a main support. The faller approached her friends for power of attorney before approaching her nephew. Though the nephew was retired, he had been caring for his own wife, who had dementia, and required close supervision and increased caregiving from 2009-2011. Due to his responsibilities, he had not been as readily available to check up on the well-being of his aunt, until after his wife passed away in the summer of 2011.

In 2011, he started driving the faller to her weekly card games when her friend was no longer able to. He preferred not to "snoop" into his aunt's affairs, and did not monitor her medication habits or personal needs. The faller gave him the impression that she was managing. He did take her to her family doctor in July 2011, for a follow up visit after a fall. He reported that the doctor told him that the faller's weight had only changed one pound since the previous year and that she seemed to be stable. He did not question the faller's cognition. He was in twice daily the seven weeks prior to her fall, after the faller's teeth surgery, to ensure the faller had soft foods to eat and to check on her well-being.

Doctor

The faller did not visit her doctor for regular check-ups. Prior to the fall in March 2012 she had not seen her family doctor for eight months (July of 2011). The doctor's standard way of practice did not have a method in place for recalling high fall risk patients. Previous to the faller's July, 2011 appointment, her last appointment had been September, 2010. The majority of the faller's doctor visits were instigated after falls, her chart contained 5 hospital emergency reports related to falls from 2001-2012. Her doctor reported that the faller only made requests for an appointment when she was ill. The faller attended medical appointments alone. By attending medical appointments alone, medical advice and suggestions given to the faller were not passed on to others to assist the faller with follow-up or to monitor adherence to advice, i.e. for TED stockings to address lower extremity edema, or for medication compliance. When the faller declined medical suggestions, the doctor did not consider contacting a substitute decision maker. The faller had a right to the privacy of her health records, and she continued to attend her appointments without supervision until July 2011. When the faller's nephew attended the July, 2011 appointment with the faller this was the first time the doctor became aware that a family member was available for support, although the faller's medical chart had listed this nephew as an emergency contact in 2001.

Community Care Access Centre (CCAC)

A Geriatric Assessment was completed for the faller in 2002 by the CCAC. The assessment was initiated by her family doctor after the faller reported concerns about forgetting names, and the doctor noted missed visits. Her mobility at that time was good, with a Timed Up and Go test score of 11 seconds. Her memory was fairly good, Mini Mental State Exam score of 25/30. The CCAC was also involved in 2007, 2008 and 2010, after falls that resulted in visits to the emergency room. Case management, occupational therapy, physical therapy and personal support workers were involved. The occupational therapist from 2010 reported that the faller's home at the time was not tidy, but that the faller was assessed to be managing and coping within her home, with the help of her friends. Assistance with her tub transfer was recommended for safety but this assistance was discontinued when the faller "fired" her support workers. Having regular assistance from a CCAC support worker would have allowed monitoring of the faller as her cognitive capacity declined.

Each time the CCAC was involved with the faller, she eventually "fired" and refused further assistance from the personal support workers. Her friend commented that faller declined the assistance from CCAC because "they didn't suit her...she [faller] felt they interfered with her routine". With no active services in place, a case manager was able to keep a file open for three months to monitor if the client's needs changed. After the three months, if the client continued to have no active services, the file was closed. A discharge summary was not sent to the family physician.

The CCAC must respect the final decision of the client, unless that individual was deemed incompetent or incapacitated. If there were any question about an individual's capacity the case manager would rather err on the side of caution, deeming a person capable, to preserve an individual's rights. A CCAC case manager commented: "It comes down to are they [the client] aware of their healthcare limitations and, even if we don't agree, what may

be the best way to address that, and are they aware of any of the repercussions that could arise out of either making a decision or not making a decision". In other words, a person is entitled to make choices that may be "bad".

SFIM

Case ID: 8100412

Date: 2013-04-03

Subject #: 15524

Swiss Cheese Report

Organizational Factors:

- To monitor a client, a CCAC Case Manager is able to hold a file with no services open for no more than three months.
- CCAC policy is to discontinue services, with no follow up, once a competent individual declines service.
- A person's capacity is rarely contested until they are hospitalized, and someone from the hospital deems the person unsuitable to go home.
- CCAC lacks a policy to inform family physicians when a client is discharged from services.
- The family doctor's standard practice has no method to monitor patients who are at risk of cognitive decline.
- Pharmacy's policy is to renew scripts for pill blister packs over the phone with the family doctor.
- Community services and programs for supporting an individual with questionable cognition are not evident to faller's friends.

Supervision:

- Doctor is unable to enforce compliance with medical recommendations given in 2002 for TED stockings and medication.
- Faller has no family caregivers to question her safety choices.
- When capacity is in question, the CCAC Case Manager will err on the side of caution to preserve an individual's rights.
- Family doctor is unaware that CCAC services are discontinued.
- Faller does not have informal or formal caregivers monitoring her cognitive status.
- Faller's nephew, her only close family member, is sole caregiver for his wife with dementia from 2009-Jul, 2011.
- Nephew only involves himself with faller's transportation needs until Feb, 2012.
- Faller's nephew does not want to pry into his aunt's affairs.
- Friends are unsure how to help the faller when the faller experiences cognitive decline but continues to refuse assistance.
- Faller's friends do not believe they have the authority to intervene with the faller's choices when they notice that the faller is more disheveled and disorganized.

Preconditions:

- Faller has the right to make her own choices, even if the choices seem to be inappropriate.
- The Personal Support Worker (PSW) services provided by the CCAC did not suit faller's schedule.
- Faller's capacity to make decisions is not formally assessed from 2002-2012.
- Faller has a history of falls.
- Faller has poor balance.
- Faller is a very independent woman.
- Faller only visits the doctor when she is ill or she has a fall requiring an emergency room visit.
- Faller presents as a capable person.
- Faller has good verbal skills.

- Faller has a history of a laissez-faire attitude.
- Faller forgets to eat breakfast on the day of this fall in 2011.
- Faller appears increasingly more dishevelled and disorganized from late 2011 to Mar, 2012.
- Faller makes excuses and laughs off any concerns her friends or nephew point out.

Unsafe Acts:

- Faller declines proposed blood pressure medication and TED pressure stocking suggested at the time of the geriatric assessment. 2002
- Faller discontinues assistance from CCAC. 2009-2011
- CCAC discharge summary is not sent to the family doctor. 2009-2011
- Faller refuses friend's offer to get Lifeline. 2011
- Faller avoids seeing her doctor for almost one year. Sep, 2010-Jul, 2011
- Faller is sent home without a cognitive assessment. Jul, 2011
- Faller frequently skips taking her medication. 2009-2012
- Faller falls at Remembrance Day ceremony. Nov, 2011

SFIM

Case ID: 8100412

Date: 2013-04-03

Subject #: 15524

Conclusions

The faller, a 90-year-old lady, lived alone in her own home. She was a very independent, active, "on the go" lady. She played bridge weekly with a consistent group of friends and was a member of a local service club. Seven weeks prior to her fall, the faller had her remaining five teeth extracted, so her dental plate no longer fit. Her nephew visited twice a day to ensure she had soft meals, and to see that she was well. On March 28, 2012, at 10:00 am, the faller fell inside her home at the front door, fracturing her right hip. Her nephew found her when he went to pick her up for a dental appointment. She reported that she had gone outside to check her flowers and fell when she came back in. The inner front door was closed when he found her, and judging from the direction of landing, it was likely that she stumbled after turning to close the door.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

- * The faller had a number of health related preconditions which contributed to the fall: history of falls, poor balance, decreased cognition (14/30 on the MMSE post fall),

- * The faller's actions and decisions also contributed to the investigated fall: she inconsistently visited her doctor, she frequently skipped taking prescribed medication, she declined medical advice, she declined Lifeline, and she discontinued daily CCAC support services. She historically had a laissez-faire attitude to life, an independent (reportedly stubborn) personality, and persuasive verbal skills.

These person-related factors were linked with the following factors at the supervision and organizational levels.

- * Family supervision was not available to monitor and question the faller's actions and compliance with medical advice prior to 2011. She was widowed and had no children. She attended medical appointments alone and there were no informal caregivers to monitor adherence to advice. When her nephew began to visit weekly in 2011, he provided transportation only and did not want to be "snoopy" into his aunt's affairs.

- * The faller's friends felt that they did not have the authority to intervene with her choices. The faller was able to "fool" those around her to hide her cognitive weaknesses. When the friends noticed an increase in the faller's dishevelled appearance and inappropriate actions, such as taking moldy cheese to a social event, they felt helpless. Friends were unaware that community agencies such as the Alzheimer Society could provide suggestions on how to support a person with any type of cognitive decline.

- * Personal Support Worker (PSW) visit times were inconsistent and did not always meet the faller's needs or preferences. Timing of Community Care Access Centre (CCAC) PSW visits reportedly interfered with faller's routine, leading to discontinuation of service. The CCAC was only able to keep a file open to monitor a client for three months, at which time if no services have been introduced the case manager must close the file. In 2010, the faller gave the false impression that she was managing well with the supports from her friends. The CCAC file was closed and not reopened. When CCAC services were discontinued, the only formal way of monitoring this possibly cognitively impaired, high fall risk individual was lost.

- * The doctor was unaware that CCAC services were discontinued or of any safety concerns the CCAC may have had when the file was closed. The CCAC does not send a discharge report to the primary care physician when services are discontinued.

- * The family physician lacked a method to trigger a recall visit to reassess patients at high risk, such as those with consistent but slow cognitive decline or a history of falls, although such follow-up visits are standard practice for individuals with diabetes.

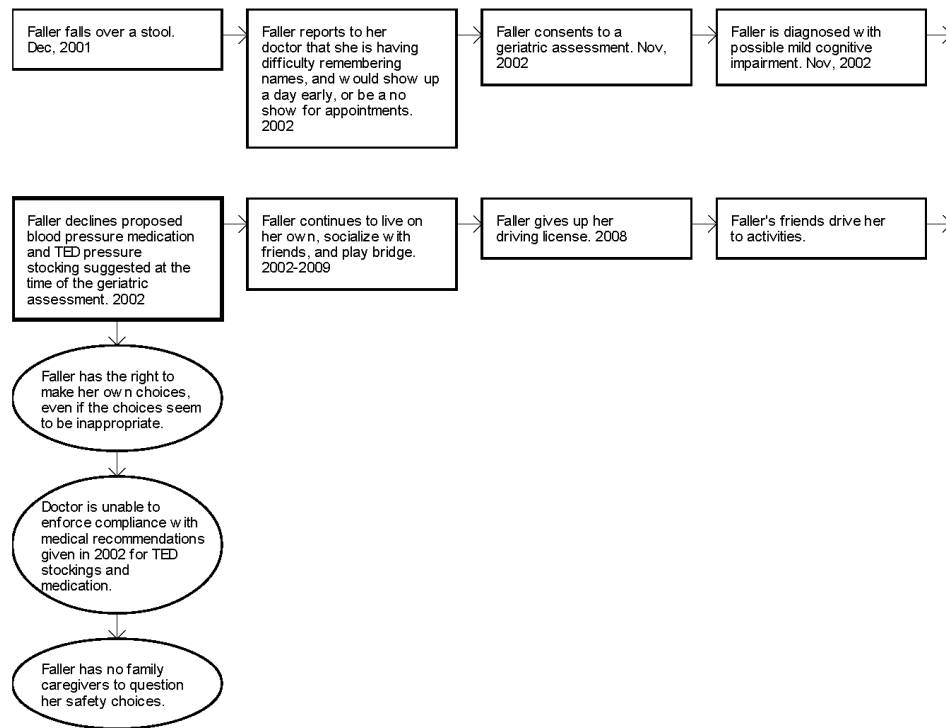
- * Neither the CCAC Case Manager nor the family physician formally questioned the faller's capacity to make her own decisions. The Case Manager's and family physician's practice was to err on the side of caution when cognitive capacity was in question, to preserve an individual's rights. A capable person is entitled to make choices that may not appear to be the best choice in the opinion of others. The faller's capacity to make decisions had not been formally assessed by a capacity assessor. A capacity assessor is a health care professional who has been

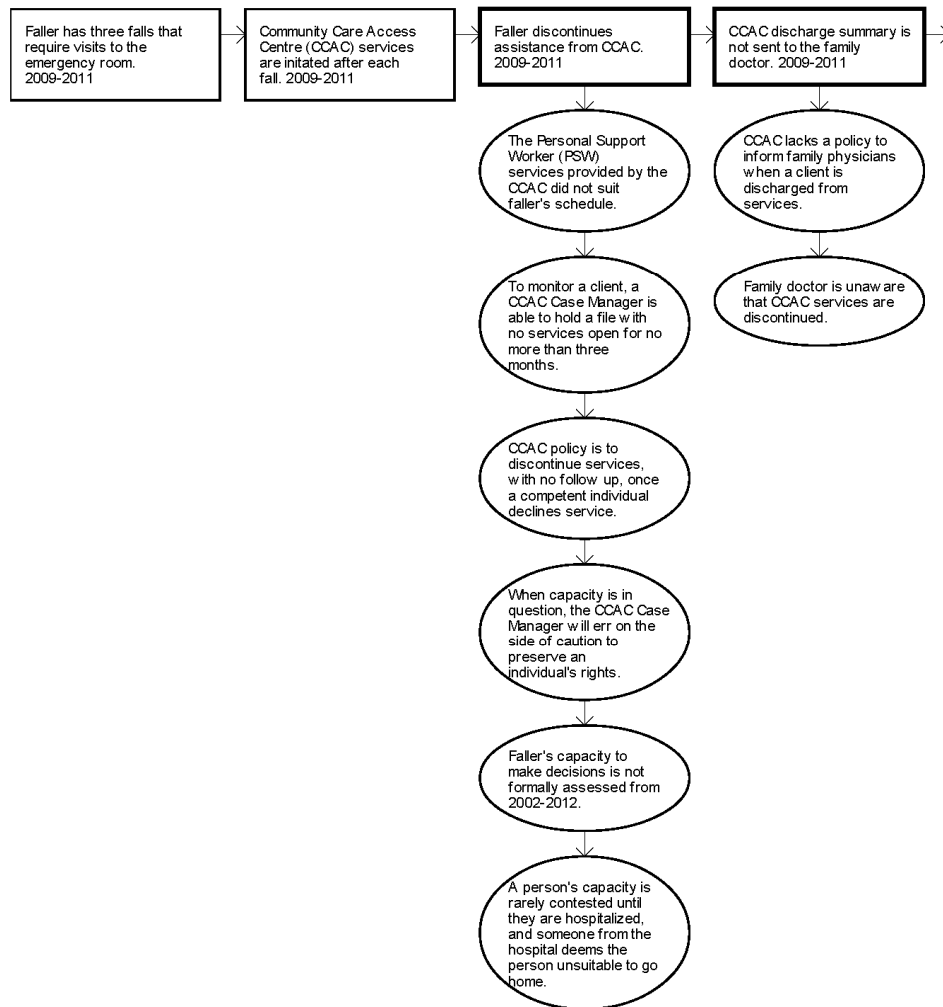
trained through the Ministry of the Attorney General to determine whether an individual is mentally incapable of certain types of decision-making. The family doctor rarely requested that a patient have a capacity assessment completed. The practice was to wait until an individual has been admitted to the hospital, and have the hospital deem an individual unsuitable for return home.

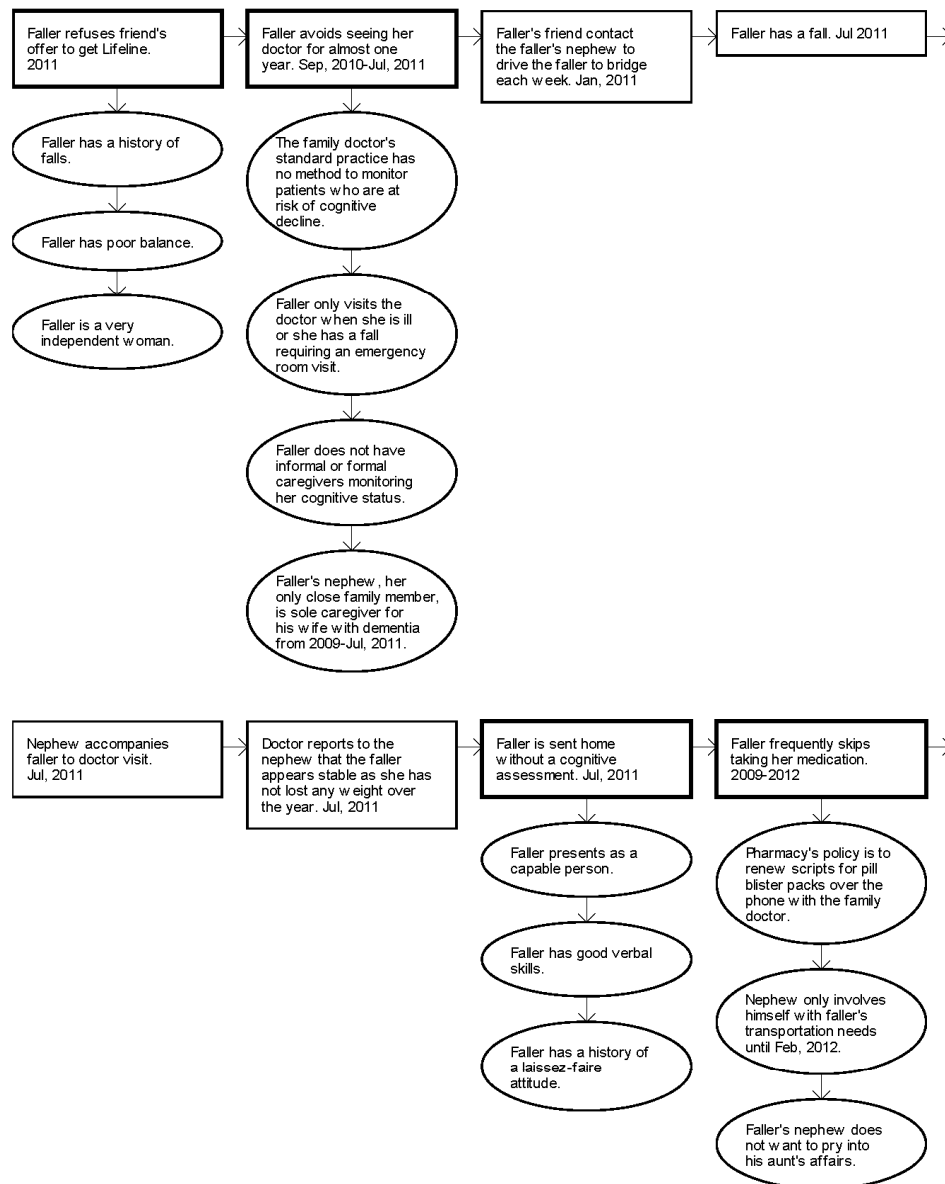
- * There was a lack of communication between doctor, nephew, friends and CCAC. This enabled the faller's cognitive decline to continue unaddressed.

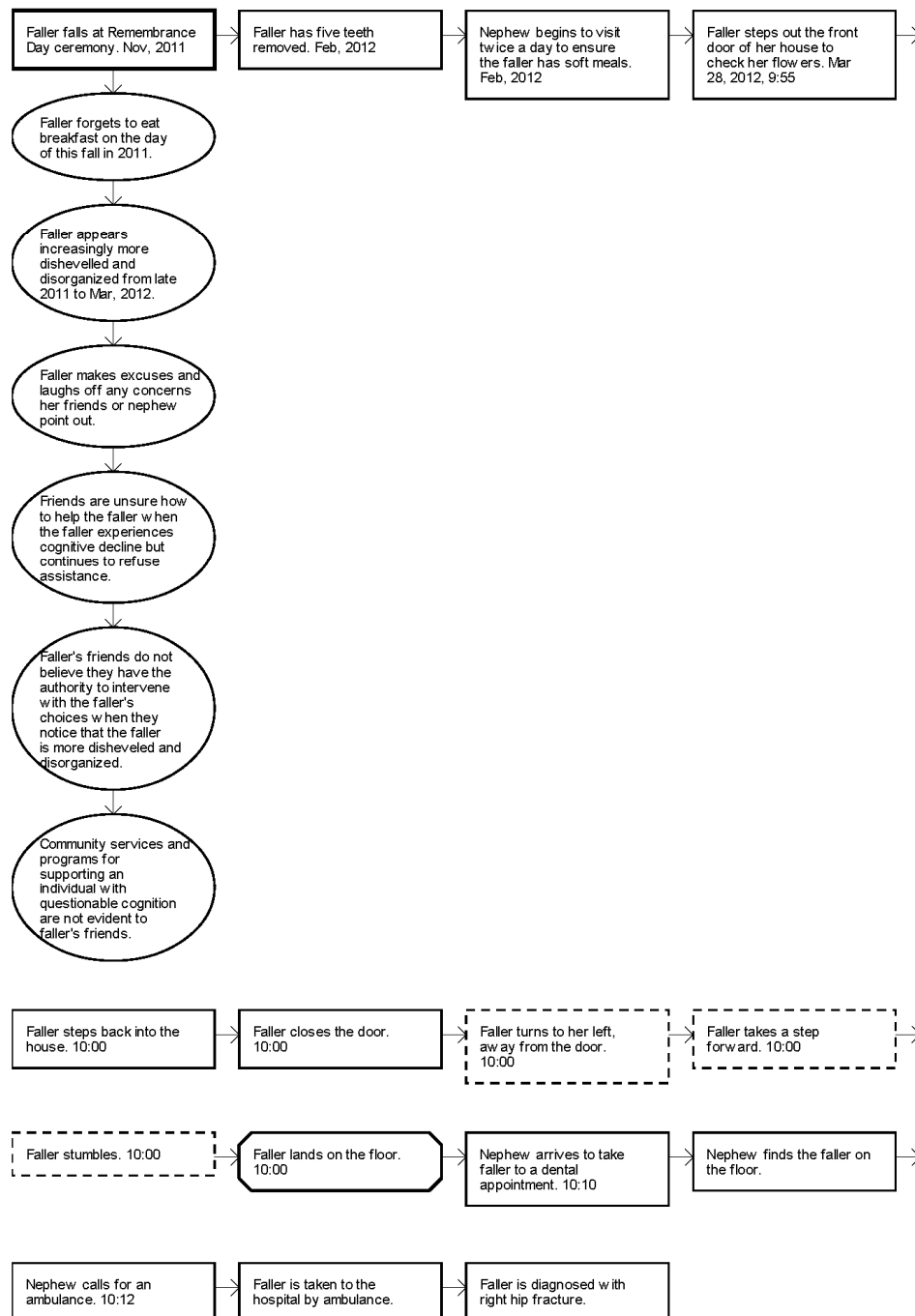
Unsafe actions and decisions combined with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.











Appendix O: Mrs. Broom Full SFIM Report

SFIM

Case ID: 8100512

Date: 2013-04-03

Subject #: 15525

Fall Information

2.1 Date of the fall: 2010-02-24

2.2 Day: Friday

2.3 Time of fall: 24-hour clock

9:00

2.4 Witnesses: ☒ Witnessed

Number of people at the scene? 1

2.5 Location of the fall: ☒ Indoors

☒ Private Residence

☒ Kitchen

2.6 Activity at the time of the fall:

☒ Walking

2.6a Was this person multi-tasking? ☒ Yes

2.7 Action by the faller prior to loss of balance:

☒ Carrying an object

☒ Walking (task-oriented)

2.8 Type of fall:

☒ Trip

2.9 Direction of the fall:

- ☒ Sideways right

2.10 Environment at the fall location:

- ☒ Obstacle on the path (clutter, animal, carpet, threshold, assistive device, etc.)

Broom had fallen in front of her.

2.11 Mobility aid used at the time of the fall:

- ☒ None

2.12 Footwear worn by the faller at the time of the fall:

- ☒ Shoes

2.13 How did faller get up after the fall?

- ☒ Assisted by another person

- ☒ EMS

Please specify how the faller was assisted:

- ☒ Manual lift (no aide by device)

2.14 Injury? ☒ Yes**2.15 Injury severity:**

- ☒ Serious - required substantial medical attention (e.g. sprain, fracture, joint dislocation, head injury, loss of consciousness, open wounds, internal injuries)

2.16 Injury type:

- ☒ Fracture

2.17 Injury location:

☒ Arm, elbow ☐ Right

2.18 Type of medical attention received:

☒ ER visit only

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No

SFIM

Case ID: 8100512

Date: 2013-04-03

Subject #: 15525



















Information About the Faller**3.1. Demographics:**Year of birth: 1927 Age Calculated: 83Gender: ☒ FemalePopulation: ☒ Senior**3.2 Falls history:**☒ Rare faller (fell only this one time in the past year)**3.4 Marital status:**☒ Married**3.5 Mental status:**☒ Normal, alert and oriented**3.6 MMSE score:**30**3.7 Education:**☒ Secondary school completed**3.8 Mobility aids:**☒ None**3.9 Other aids used by the faller:**☒ Bath bench/shower seat☒ Bathroom grab bar☒ Rubber bathmatBathroom grab bar is removeable clamp on tub rail.**3.10 Medical problem at the time of the fall:**

☒ Blood pressure (high or low)

☒ High Cholesterol

3.11 Medications:

6 Number of prescription medications used by the faller on the day of the fall

   Medication Name: Micardis
   Medication Name: Atenolol
   Medication Name: Sulcrufate
   Medication Name: Cholestramine
   Medication Name: Hydrochlorathiaz
   Medication Name: B12

1 Number of over-the-counter medications used by the faller on the day of the fall

   Medication Name: Aspirin

SFIM

Case ID: 8100512

Date: 2013-04-03

Subject #: 15525

Investigative Report Summary

On February 24, 2012 the faller fell inside her home. She tripped over a broom handle as it slipped along a kitchen counter to the floor in front of her. In a rush, she had intentionally left the broom leaning against the kitchen counter, aware that the position was unsafe as the broom had fallen over from that position in the past. When she fell, she landed on her right arm and fractured her humerus. She required medical attention at the emergency department.

The Faller

Faller was an 85-year-old lady who lived with her husband in a home they had built in 1991, planning for their retirement years. She was an alert lady who had worked part time in a nursing home after her seven children grew up. She had no concerns with her memory, scoring 30/30 on the Mini Mental State Examination. Her husband had decreased balance, and used a cane for fall prevention, limiting his involvement in household tasks. The faller was responsible for all meals and household chores for herself and her husband. She had one previous fall "3-4 years ago" while rushing to answer her phone. She did not seek medical attention at the time, but later discovered that she had fractured a small bone in her wrist. As a result of arthritis, she had right hip replacement surgery in 2008, and expected she would need the left replaced in the near future. She had had cataracts removed from both eyes and wore bifocals. She reported her vision was good, as she was able to read the newspaper daily.

The faller reported "not [doing] much of anything really" to keep functional. She was active with household chores and meal preparation, but did not participate in any consistent exercise routines. She was fortunate to have good balance and range of motion without a formal exercise program.

According to the faller the hip she had had replaced in 2008 was working well. Her left hip was arthritic, but had not degenerated enough to require a replacement. However, arthritic changes in the joint affected its strength and combined with changes due to age that increased her reaction time. Her ability to make quick corrective movements to restore balance was therefore decreased.

The Fall

In preparation for cleaning the house, the faller placed a broom against the counter in the kitchen. The broom had fallen to the ground in the past from this position. She was aware that this was not a good position for the broom, but she wanted to return quickly to the closet to retrieve the cloth she had forgotten. As she walked back into the kitchen the broom slid sideways and fell to the floor in front of her feet. She did not have sufficiently quick reflexes stop walking forward. She tripped over the broom, was unable to restore balance, and landed on the floor.

Falls Prevention Education

Though this was the faller's second fall in the past five years, she did not recall receiving any formal fall prevention education. The Public Health Unit did have falls prevention resources, but had not held a formal falls prevention information session in the small town since 2006. A "Living with Vitality" conference was held in the town in 2011, which the faller had not attended. The Health Unit released three main falls prevention messages in local newspapers: "check you meds", "watch your steps-take your time" and "keep active". Two messages were published in the local newspaper, and the last one was included in the free weekly paper when a senior's focused edition was published. The messages were gradually released over a two year period. She did not recall having knowledge of the Health Unit's ongoing fall prevention campaigns.

The faller had received occupational therapy (OT) and physical therapy (PT), through the Community Care Access Centre (CCAC), in 2008 post hip surgery and in March, 2012 after the investigated fall. Her occupational therapist reported that fall prevention strategies and home safety tips were given to the faller and her daughter during her therapy sessions. The faller did not recall receiving falls prevention education after her hip surgery.

The daughter reported that the family had been trying to have the faller and her husband install wall grab bars in the bathtub area and to put a barrier in front of the open stairway. They were concerned about it, as the husband

had fallen down the stairway. The daughter had the impression that her parents believed the aids were useful when recuperating from an incident or surgery, but were not necessary for day-to-day activities. The faller did not see the need for the fall prevention strategies encouraged by her family.

Broom Handle Options

The broom used by the faller had a wooden handle that was painted and very smooth, and had a tendency to slide down when left leaning against the kitchen counter. Some broom handles do have a nonslip end designed to prevent the broom from sliding over when it is set against a wall. However, this handle design would not have prevented sliding when leaned against a kitchen counter.

A survey of brooms sold in the local stores revealed that non-slip handle broom styles were not available for purchase. Most handles were of varnished wood, or coated in plastic. Only one style of an outdoor rake did have the top 40 cm of the handle covered in nonslip foam which was likely meant for user's comfort rather than slip protection.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

[bottom of broom.jpg](#)

[broom along counter.jpg](#)

[broom on floor.jpg](#)

SFIM

Case ID: 8100512

Date: 2013-04-03

Subject #: 15525

Swiss Cheese Report

Organizational
Factors:

- A formal, general public falls prevention session has not been completed in the small town since 2006.
- Fall prevention messages published in local weekly paper did not reach the faller.
- Community OT fall prevention strategy involves formally reviewing a 2 page handout during initial assessment, with informal discussion for follow up.
- Brooms with non-slip handles are not readily available.

Supervision:

- Fall prevention suggestions given by the community OT are not memorable.
- Daughter is unable to convince faller to implement home safety suggestions.
- Husband fails to recognize need for implementing daughter's safety suggestions in home.

Preconditions:

- Faller has a history of arthritis in both hips.
- Faller has poor hip joint hip strength.
- Faller has difficulty making quick movements to correct her balance.
- Faller does not recall receiving formal fall prevention education.
- The broom has fallen over in the past when leaned against the counter.
- The broom handle is smooth, lacking friction to prevent sliding over.
- Broom handle lands on floor in front of faller's feet.
- Faller has poor reaction time.
- Faller has history of one previous fall.

Unsafe Acts:

- Faller has right hip replaced. 2008
- Faller's daily exercise routine consists of regular household chores. 2008-2012
- Faller fails to recognize the need for safety changes within her home.
- Faller sees herself as a healthy, active older adult.
- Faller declines to follow up on suggestions to increase home safety. 2011
- Faller is multi-tasking,
- Faller is in a hurry to get a lot done that day.
- Faller ignores past preference of placing broom in the corner of the counter.
- Faller leans the broom against the kitchen counter. 09:02
- Faller stumbles forward over the fallen broom. 09:03

SFIM

Case ID: 8100512

Date: 2013-04-03

Subject #: 15525

Conclusions

The faller, an 85-year-old lady, fell on February 24, 2012, inside the home she shared with her husband. She fell forward, landed on her right arm and fractured her humerus. The faller was responsible for all the meals and household chores for herself and her husband. On the day of the fall, she tripped over a broom handle as it slipped along a kitchen counter to the floor in front of her. In the rush that morning to get things done, she had intentionally left the broom leaning on the kitchen counter. The faller was aware the broom position was unsafe, as the broom had fallen to the floor in the past. After the fall she required medical attention at the emergency department of the hospital.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

- * The faller had a number of health related preconditions which contributed to the fall: history of one previous fall, history of arthritis, right hip replaced in 2008, arthritis in left hip, and a decrease in reaction time related to age and decreased activity level.

- * The faller's actions and decisions also contributed to the investigated fall: rushing while multitasking, and leaving a broom that had a history of sliding down leaned against the counter.

These person-related factors were linked with the following factors at the supervision and organizational levels.

- * Public Health Unit fall prevention education was not reaching seniors in the community or influencing their unsafe behaviours. A formal, public fall prevention session has not been offered in this small town by the Public Health Unit since 2006. The Health Unit changed focus from formal workshops on falls prevention to printed media messages to educate seniors about fall prevention. The faller had not seen these media messages, although she regularly reads newspapers.

- * Fall prevention education from occupational therapist was not memorable for the faller. She did not recall safety suggestions given at the time of her hip surgery in 2008, or even after this most recent fall. The faller has no recollection of being formally educated on fall prevention strategies, though the Community Care Access Centre (CCAC) had put therapy services into place for safety in the home.

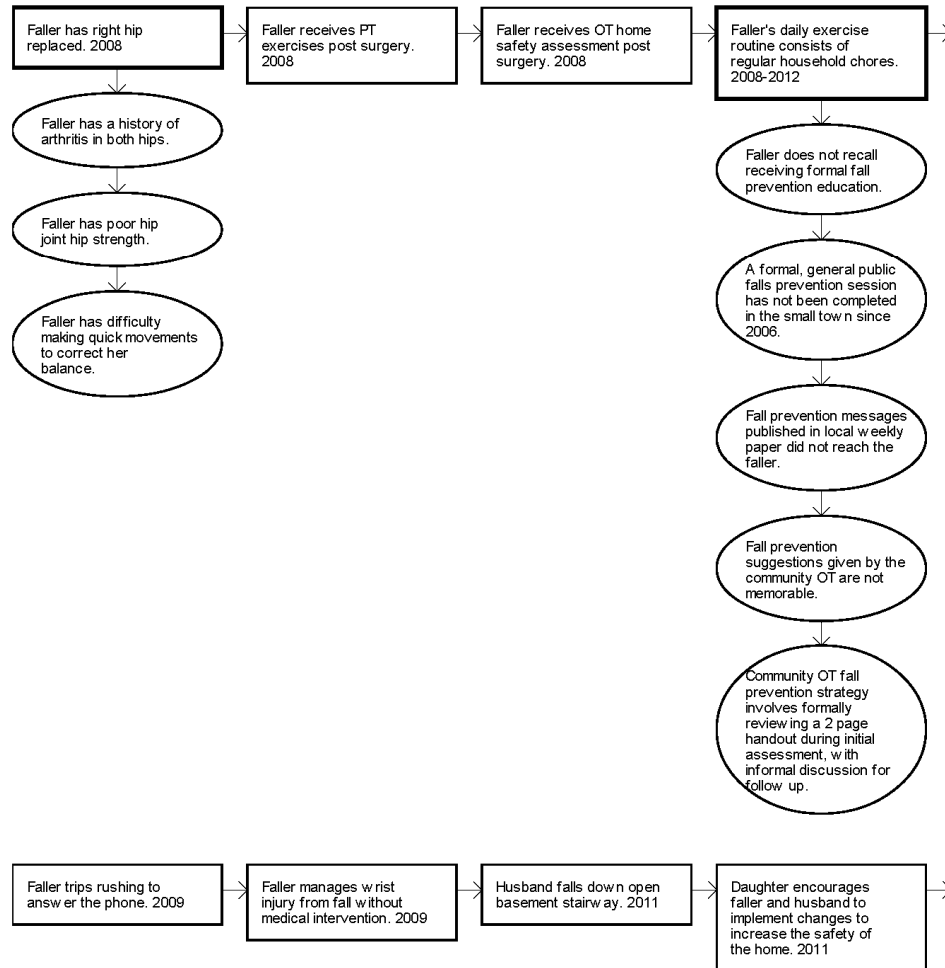
- * Brooms are manufactured with handles that do not have a non-slip surface to prevent sliding when leaned against a counter. Most brooms have varnished or PVC coated handles, which are smooth, allowing the handle to slide when placed against a counter. There were no brooms with non-slip handles available for purchase in the local stores.

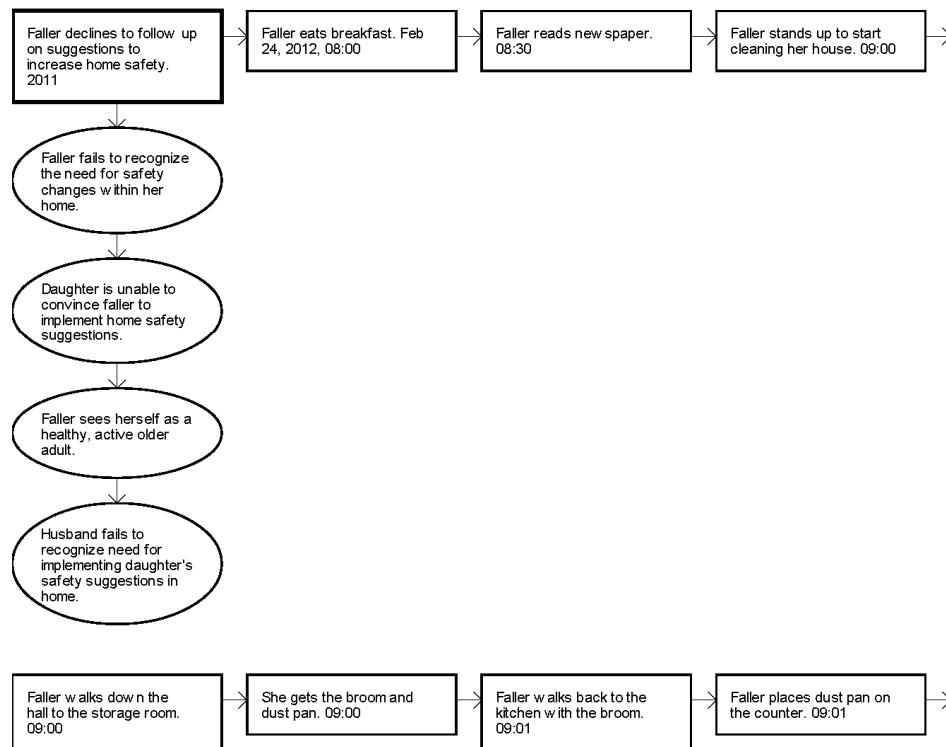
- * Daughter was unable to convince faller to incorporate more fall prevention strategies into daily activities. Faller felt the changes did not apply to her with her current functional status and the faller felt that she was a competent adult. The daughter was unable to enforce her suggestions.

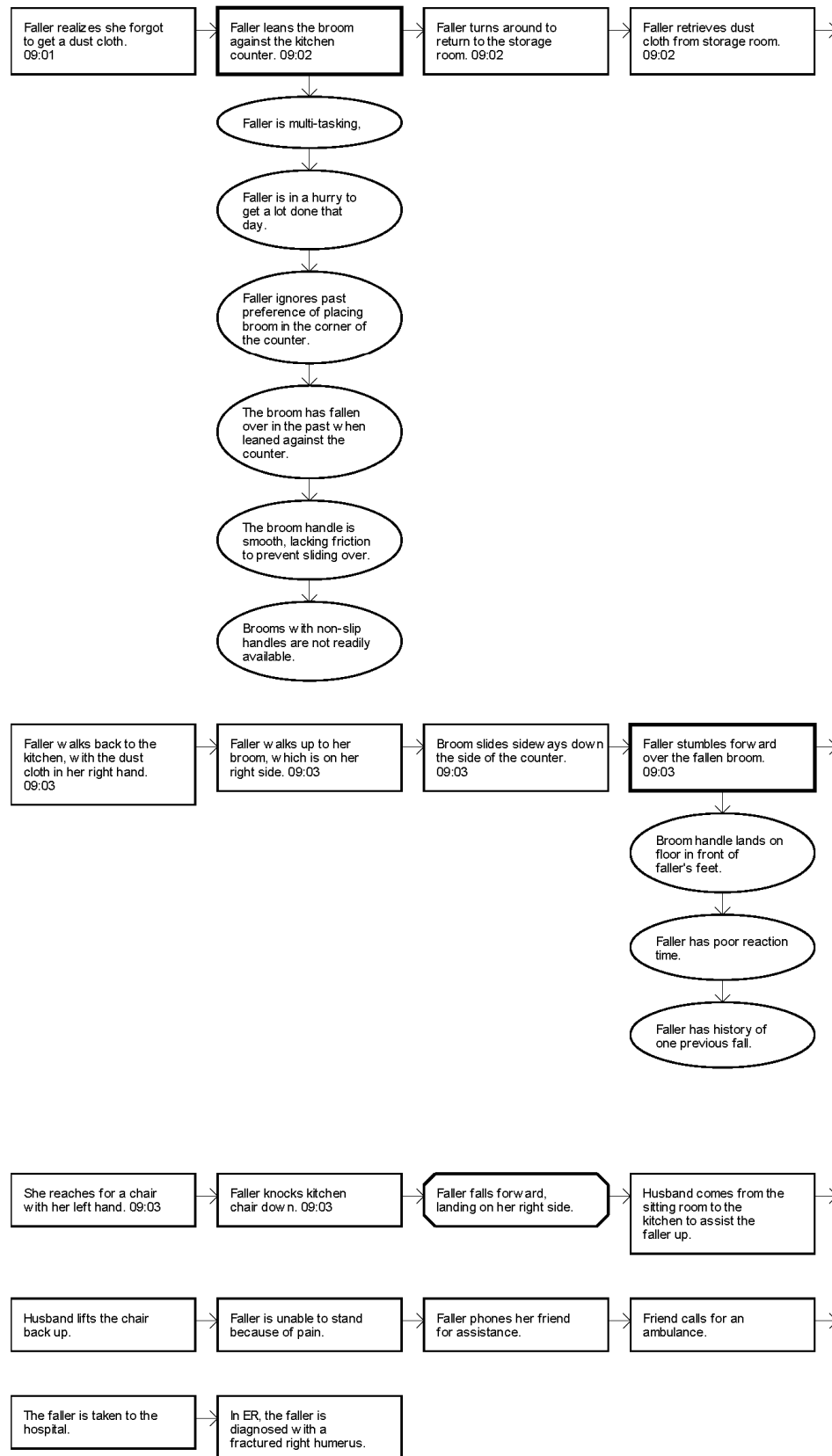
Unsafe actions and decisions combined with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.



Sequence of Events: 15525







Appendix P: Mrs. Peters Full SFIM Report

SFIM

Case ID: 8100612

Date: 2013-04-03

Subject #: 16036

Fall Information

2.1 Date of the fall: 2012-04-30

2.2 Day: Monday

2.3 Time of fall: 24-hour clock

18:45

2.4 Witnesses: ☐ Un-witnessed

2.5 Location of the fall: ☐ Indoors

☐ Private Residence

☐ Kitchen

2.6 Activity at the time of the fall:

☐ Cooking

2.6a Was this person multi-tasking? ☐ Yes

2.7 Action by the faller prior to loss of balance:

☒ Reaching down (bending)

☒ Reaching forward

2.8 Type of fall:

☐ Loss of support

2.9 Direction of the fall:

☐ Back

2.10 Environment at the fall location:

☒ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☒ Other, please specify:

faller was leaning with one arm onto a stool.

2.12 Footwear worn by the faller at the time of the fall:

☒ Bare feet

2.13 How did faller get up after the fall?

☐ Alone (self initiated)

2.14 Injury? ☐ Yes

2.15 Injury severity:

☐ Moderate - required medical attention (e.g. strain, extensive bruising, laceration, bleeding, burn, chipped tooth)

2.16 Injury type:

☒ Bruise

☒ Laceration/cut

2.17 Injury location:

☒ Head and neck

☒ Arm, elbow ☐ Left

2.18 Type of medical attention received:

☒ ER visit only

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☒ Yes, please specify:

The faller was reaching into the cupboard where she stores infrequently used items.

SFIM

Case ID: 8100612

Date: 2013-04-03

Subject #: 16036

Information About the Faller**3.1. Demographics:**Year of birth: 1924 Age Calculated: 88Gender: ☐ Male ☒ FemalePopulation: ☒ Senior**3.2 Falls history:**☐ Rare faller (fell only this one time in the past year)**3.4 Marital status:**☐ Married ☒ Widowed**3.5 Mental status:**☒ Normal, alert and oriented**3.6 MMSE score:**26**3.7 Education:**☐ High school graduate ☒ Secondary school partial**3.8 Mobility aids:**☒ Cane☐ All of the time☒ Power chair/scooter☐ Occasionally☒ Walker with 4 wheels for indoor or outdoor use (rollator) ☐ Occasionally**3.9 Other aids used by the faller:**☒ Bath bench/shower seat☒ Bathroom grab bar

☒ Rubber bathmat

3.10 Medical problem at the time of the fall:

☒ Arthritis

☒ Osteoarthritis

☒ Heart conditions

☒ High Cholesterol




3.11 Medications:

6 _____ Number of prescription medications used by the faller on the day of the fall

   Medication Name: Mylan-Warfarin

   Medication Name: Toloxin

   Medication Name: Synthroid

   Medication Name: Nitrolingual pump spray

   Medication Name: Apo-enalapril

   Medication Name: Fosavance

0 _____ Number of over-the-counter medications used by the faller on the day of the fall

SFIM

Case ID: 8100612

Date: 2013-04-03

Subject #: 16036

Investigative Report Summary

On April 30, 2012 the faller fell inside her home after pulling out a bowl from a low, under-counter cabinet. This corner cabinet was awkward to access, and she stored infrequently used kitchen items there. On the day of the investigated fall, she needed a large bowl which she did not use often. She leaned her left elbow on a bar-style stool as she reached down and forward towards the back of the cabinet. She was able to successfully pull the bowl out and place it up on the counter in front of her. As she pushed to stand up, the stool, which had rubber tips on the legs, tipped to the left side, which caused the faller to lose balance and fall backwards. She struck the back left side of her head and required three staples at the emergency department to close the wound. She also bruised her left upper arm.

Faller

Faller was an 88-year-old lady who lived alone. Her daughter was very supportive and visited or called her mother daily to check up on her or assist with tasks. The faller had good range of motion and functional strength in her arms and legs but her endurance and balance were decreased. She had a history of back pain, and used either two canes or rollator walker for mobility within her apartment. The faller had a scooter, which she used for outdoor mobility. She was a quiet lady who kept to herself as there was not a common room in the building where she could meet up with other residents. Also, the faller was taking blood pressure medication designed to relax the blood vessels. This medication combined with bending would require a moment for her blood pressure to adjust when returning to an upright position. With the stool tipped over, as she started getting up from the bent over position, the faller was unable to prevent herself from falling backward.

Kitchen Design

The faller moved into her new apartment in April 2011, a year before her fall. She had one fall in the bathroom of her previous residence, and no falls in the new apartment. She moved into the newly built residence with the understanding that it was "senior friendly". The day the family helped the faller move in, her granddaughter noticed that the kitchen cupboards were very high. In addition, the lower deep corner cupboards were awkward, and required an individual to lean down and over-reach in order to access items stored in it.

The faller was aware of the difficulty to put items in and out of this poorly designed lower storage area, and she placed her least used cooking items in this space. To improve access to this space and make the reach safer, the faller utilized a stool to support her left arm while she leaned down and reached with her right arm to the back of the cupboard.

The Building and the Building's Senior Friendliness

The building where the faller lived was dedicated for low-income senior citizens and the disabled, and was publically funded. A media release in June 2010 stated the project would provide "safe, affordable housing that meets their [senior tenants] needs". A federal and provincial grant of \$1.7 million covered two thirds of the building cost. The building had 23 units, and the seven ground floor barrier-free units were wheelchair friendly and fully accessible. This exceeds the building code requirement that 10% of the units in a publically funded building need to be wheelchair accessible. The director of planning for the small town reported that the final design and layout of the building was left up to the builder and the architect. The county housing authority, who had the responsibility of awarding the building contract, reported that they were satisfied that the builder had followed code, and that they had ensured that the building was accessible. The building did meet all the criteria for accessibility according to the Ontario building code. The builders even added in some extra features not often included in low-income buildings. Each apartment had laundry facilities, and each floor had an extra storage room with electrical outlets, that could be used for storing and charging scooters. Behind the fibreglass tub walls the wall was reinforced, but the grab bars were not installed. All the units were bright and the doors and halls were wide enough to allow use of mobility aids. The builder followed universal design guidelines for the units dedicated

to tenants with disabilities, but reported that for the apartment units geared towards seniors “there [were] no particular standards to follow”.

Though there may have been no specific codes to follow for “senior friendly” apartment units, there are checklists and guidelines available recommending design features that allow seniors to age-in-place safely. The National Association for Home Builders (NAHB) had compiled one such checklist of features to consider when building a residence for older adult clients. The purpose of the checklist was to meet long term needs and allow aging-in-place. NAHB also offered a course for certified aging-in-place specialist (CAPS) designation. Neither the county housing authority nor the builder were aware of this designation or age-in-place design checklists.

Aging-in-place Design Checklist

To determine which features of this newly built building met the features of age-in-place design suggestions, the faller’s apartment was evaluated by the SFIM investigator (also a practicing occupational therapist). The NAHB checklist was chosen as it is, in the opinion of the investigator, comprehensive and thorough. The entrances, hallways, elevator, stairs and thresholds met the design checklist suggestions; while the kitchen, bathroom, storage, lighting, and electrical details partially met the design checklist suggestions. Some of the partially met considerations would have involved more expensive options, i.e. pull-down shelving in the kitchen, front loading washer and dryer, or a security system directly wired to the emergency services. However, as outlined below, the majority of the partially met suggestions could have been accommodated at the time of building with little extra cost,;

- * Lower windows with easy to operate hardware (current windows have a 45” sill height and two latches, 56” and 78” height which are difficult to reach). A certified aging-in-place specialist (CAPS) interviewed for this investigation recommended a casement window at a lower height.
- * A pantry cupboard would allow for easy access to kitchen storage.
- * Upper wall cabinets 3” lower than conventional height of 54” (current cabinets are 56” high, 2” higher than conventional height).
- * Glass front cabinet doors help seniors with mild memory concerns, and those with many different helpers.
- * Open shelving for frequently used items.
- * Easy to read appliance controls at the front of the stove.
- * Side by side refrigerator/freezer.
- * A smaller model raised dishwasher.
- * Open under-counter seated work area in the kitchen.
- * Task lighting in work areas.
- * Lower height bathtub for easy access. Current bathtub height was 20” high, which the CAPS confirmed to be too high. The specialist recommended a walk-in shower unit for seniors who are not likely to soak in the tub.
- * Toilet 2½” higher than standard height of 15”.
- * Toilet paper holder that can be changed with one hand, i.e., slide on bar for roll versus spring loaded holder.
- * Adjustable closet rod and shelves.
- * Lighting in closets.
- * Thermostat no higher than 48 inches from floor, current model display screen was at 61”.

From an occupational therapist perspective, towel bars will inevitably be used as a grab bar for those with decreased balance and should be replaced with a horizontal grab bar at the time of construction when a building was designed with seniors in mind. Tub bars should also be pre-installed according the CAPS contact. Anyone can be at risk to fall, young or old. Grab bars will often not be requested until after a fall has occurred and the individual was injured. A building designed to be senior friendly needs to be pro-active, not-reactive (Edwards, N., Birkett, N., Nair, R., Murphy, M., Roberge, G., & Lockett, D. (2006). Access to bathtub grab bars: Evidence of a policy gap. *Canadian Journal on Aging*, 25(3), 295-304).

SFIM

Case ID: 8100612

Date: 2013-04-03

Subject #: 16036

Swiss Cheese Report

Organizational
Factors:

- The county housing authority has no policy requiring the builder to have age-in-place design knowledge.
- Neither the county housing authority nor the builder are aware of safety benefits for seniors that age-in-place design can offer.
- The Ontario building code has no policy for mandatory age-in-place design in public buildings designed for seniors.

Supervision:

- The builder of this senior and disabled persons residence did not implement age-in-place kitchen design features into the units for seniors.
- Family assist with placement of less frequently used kitchen items into awkward lower cupboard.

Preconditions:

- Faller's kitchen lacks easy to access storage.
- The lower corner cupboard where the bowl is stored is difficult to reach into.
- Faller has high blood pressure.
- Faller is on a blood pressure medication (enalapril) known to cause orthostatic hypotension.
- Leaning down and reaching forward can affect blood pressure.
- Faller has poor balance requiring conscious effort to keep upright.
- Faller has had one previous fall.
- Stool tips over sideways.
- Faller is unable to stop backward motion when she loses support from the stool.
- Faller has decreased strength.

Unsafe Acts:

- Faller moves into a newly built senior friendly apartment building. Apr, 2011.
- Faller stores her less frequently used items in a deep corner cupboard, under the counter. Apr, 2011.
- Faller reaches into a cupboard that she does not access frequently.
- Faller bends forward from standing position, supporting herself with her left arm on the stool. 18:57.
- Faller is multi-tasking.
- Faller reaches forward with right hand to the far back of the low cupboard.
- Faller quickly straightens up. 18:58

SFIM

Case ID: 8100612

Date: 2013-04-03

Subject #: 16036

Conclusions

The faller, an 88-year-old lady, fell on April 30, 2012 at 6:45 pm while reaching down into a deep corner cupboard for an infrequently used bowl. The faller had made some strawberry sauce that evening and wanted to put it away. She needed to access a bowl stored in the back of a lower, deep corner cupboard that was difficult to reach. She leaned over, supporting herself on a tall stool, and reached to the back of the cupboard for the large bowl. She placed the bowl on the counter, but before she was able to stand up, the stool tipped sideways, and she fell over backwards. The faller moved into this newly built apartment building, geared towards low-income seniors and persons with a disability, in April 2011, a year before the investigated fall.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

* The faller had a number of health related preconditions which contributed to the fall: a past fall in the bathroom of her previous residence, blood pressure medication and poor balance.

* The faller's actions and decisions also contributed to the investigated fall: multitasking while leaning on a stool and reaching forward into a deep cupboard.

These person-related factors were linked with the following factors at the supervision and organizational levels.

* The faller's family assisted the faller to store some kitchen items in a low, deep corner cabinet that was difficult to reach. Family were aware of the awkward kitchen storage space, but assisted the faller to set up items as best as possible within the kitchen cabinet design, storing less frequently used items in the corner cabinet. As the kitchen lacked easily accessible storage space between shoulder and waist height, the faller had no option but to store items that required occasional access in a difficult to reach area.

* Age-in-place design features were not implemented within this newly built apartment in the units geared to seniors. Checklists with age-in-place design suggestions are readily available on-line.

* The county housing authority's procedure for awarding a \$1.7 million contract for construction of a senior friendly building did not include consideration of age-in-place design features.

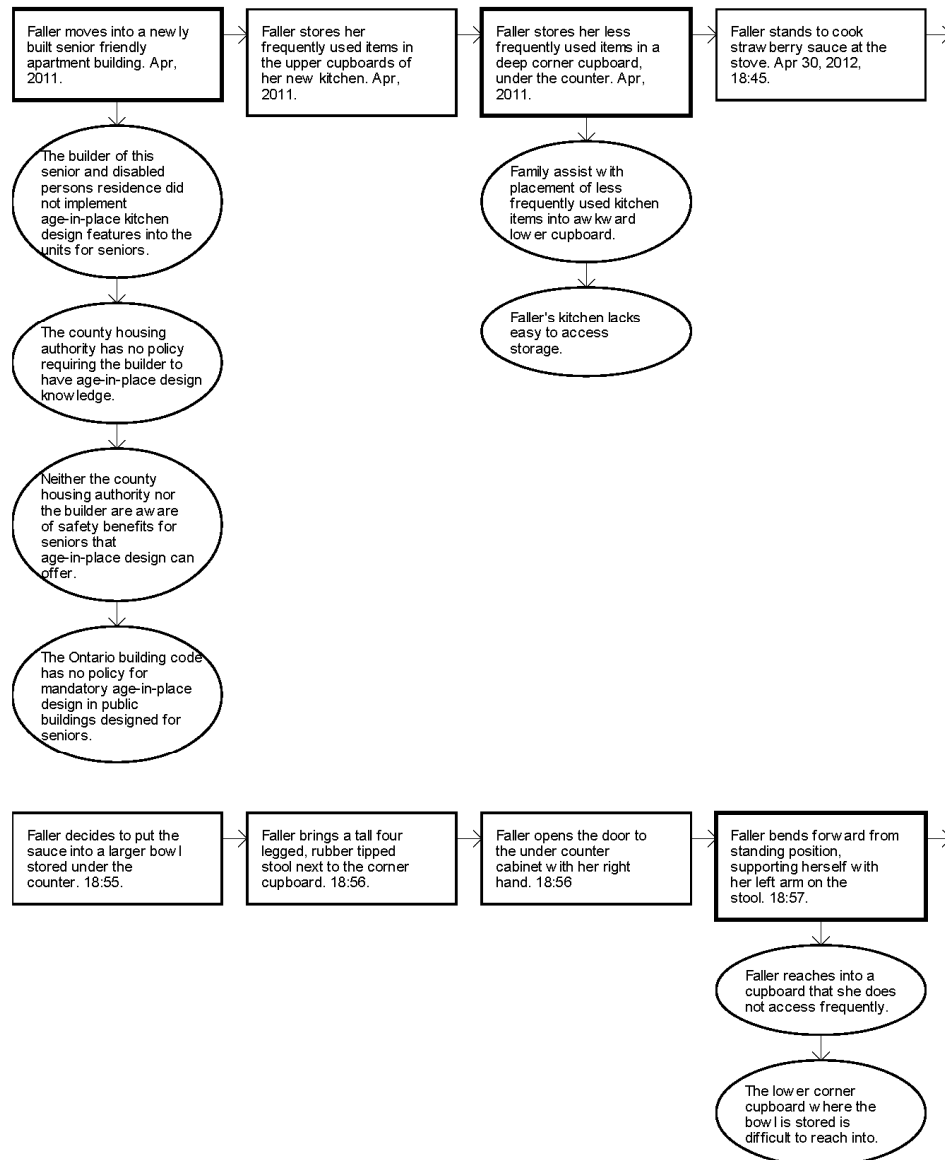
* The contractor, as well as the county housing authority, were unfamiliar with age-in-place design features.

* Ontario building code lacked age-in-place design considerations. Wheelchair accessibility design features and universal design guidelines are integrated into the Ontario building code, but specific age-in-place designs are not mandatory.

Unsafe actions and decisions of the faller, family, county housing authority and builder combined with contributing latent conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.



Sequence of Events: 16036





Appendix Q: Mrs. Rose Full SFIM Report

SFIM

Case ID: 8100712

Date: 2013-04-03

Subject #: 16259

Fall Information

2.1 Date of the fall: 2012-05-10

2.2 Day: Thursday

2.3 Time of fall: 24-hour clock

14:30

2.4 Witnesses: ☒ Un-witnessed

2.5 Location of the fall: ☒ Indoors

☒ Private Residence

☒ Bedroom

2.6 Activity at the time of the fall:

☒ Standing on both feet

2.6a Was this person multi-tasking? ☒ Yes

2.7 Action by the faller prior to loss of balance:

☒ Reaching forward

2.8 Type of fall:

☒ Loss of support

2.9 Direction of the fall:

☐ Sideways left

2.10 Environment at the fall location:

☒ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☒ None

Faller holding onto a straight back wooden chair.

2.12 Footwear worn by the faller at the time of the fall:

☒ Bare feet

2.13 How did faller get up after the fall?

☐ Assisted by another person

☒ Family/Friend/Roommate

Please specify how the faller was assisted:

☒ Manual lift (no aide by device)

2.14 Injury? ☐ Yes

2.15 Injury severity:

☐ Minor - did not require medical attention (e.g. bruise, abrasion, contusion)

2.16 Injury type:

☒ Bruise

2.17 Injury location:

☒ Head and neck

☒ Leg, knee, foot, toe(s) ☐ Right

2.18 Type of medical attention received:

☒ None

2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)

☐ No

SFIM

Case ID: 8100712

Date: 2013-04-03

Subject #: 16259

Information About the Faller**3.1. Demographics:**Year of birth: 1924 Age Calculated: 88Gender: ☒ FemalePopulation: ☒ Senior**3.2 Falls history:**☒ Multiple faller (falls regularly)**3.3 To get an idea of the frequency with which this person falls, please answer the following questions:****a) Falls frequency**Number of falls in the last week: 0Number of falls in the last month: 1Number of falls in the last year: 3**b) Loss of balance frequency** - Number of near falls (sudden or uncontrollable losses of balance without landing):☒ Unknown**3.4 Marital status:**☒ Widowed**3.5 Mental status:**☒ Normal, alert and orientedMMSE low due to low literacy level.**3.6 MMSE score:**23**3.7 Education:**☒ Primary school partial

3.8 Mobility aids:

☒ Walker with 4 wheels for indoor or outdoor use (rollator) ☒ All of the time

3.9 Other aids used by the faller:

- ☒ Bath bench/shower seat
☒ Bathroom grab bar
☒ Bed rails
☒ Glasses ☒ for distance ☒ for reading
☒ Raised toilet seat/Commode
☒ Ramp
☒ Rubber bathmat

3.10 Medical problem at the time of the fall:

- ☒ Arthritis ☒ Osteoarthritis
☒ Blood pressure (high or low)
☒ Deconditioning
☒ Diabetes (hypoglycemia)
☒ Heart conditions
☒ Muscle weakness

☒ Stroke Functional Independence Measure Score (Maximum score 126):

☒ Not available

Montreal Cognitive Assessment Score (Maximum score 30):

0



















Montreal Cognitive Impairment Score (MoCA < 26):

☒ Not available

3.11 Medications:

11 Number of prescription medications used by the faller on the day of the fall

- ☒ Medication Name: Acetaminophen
☒ Medication Name: Amlodipine Besylate
☒ Medication Name: Atorvastatin calcium
☒ Medication Name: Clopidogrel bisulfate
☒ Medication Name: Diamicron Mr

  	Medication Name:	<u>Gapapentin</u>
  	Medication Name:	<u>Hydrochlore thiazide</u>
  	Medication Name:	<u>Metformin HCL</u>
  	Medication Name:	<u>Metaprolol tartrate</u>
  	Medication Name:	<u>Synthroid</u>
  	Medication Name:	<u>Trimethoprim</u>

0 _____ Number of over-the-counter medications used by the faller on the day of the fall

SFIM

Case ID: 8100712

Date: 2013-04-03

Subject #: 16259

Investigative Report Summary

On May 10, 2012 the faller fell inside her home while reaching for a container of TUMS. She came home from her Adult Day Program fatigued and with an upset stomach. She walked to the bedroom where she leaned on the back of a chair with her left hand as she reached forward with her right hand to a narrow shelving unit in the corner. As she grasped the container of TUMS, she straightened up, lost her balance and fell backward to the left side, pulling the chair with her. After several unsuccessful attempts to get up on her own, she pressed the Lifeline button. Her son-in-law came over and assisted her onto the side of her bed. The faller had bruised head and right leg. She did not require medical attention.

Faller

Faller was an 88-year-old lady who lived alone in her own home. Her family were very involved in her care. Three of her five children lived close by, and at least two of her children were in every day to assist with personal care. The faller required daily morning assistance to set out her clothing, comb her hair, test her glucose levels and take the dog outside. Each evening she required assistance with changing her clothing, injecting insulin, and taking the dog out for a walk.

The faller's health history included diabetes, increased blood pressure, arthritis, heart attack, cellulitis, re-occurring urinary tract infections, and re-occurring upset stomach. She was on 11 prescription medications. On December 31, 2011, the faller experienced a stroke. She was in the hospital until February 1, 2012. She had decreased strength in her left leg and arm due to the stroke, decreased coordination in her left hand limiting functional use, decreased balance necessitating the use of a rollator walker for mobility indoors and decreased endurance necessitating the use of a wheelchair for mobility outdoors. She scored 23/30 on the MMSE, mainly due to her low literacy level and partial completion of primary school. The faller was alert and oriented. The faller's daughter reported that since the stroke, the faller's personality had changed. This affected how she interacted with others; the faller was "more trying on us". The daughter gave an example that the faller had started to swear, while in the past she had been quite strict with her children about not swearing.

Issues with Personal Support Workers

A few days before the fall, the faller cancelled her daily morning personal support worker (PSW) visits. Prior to her stroke the faller had been receiving personal support assistance three times a week and was pleased with the services at that time. The Community Care Access Centre (CCAC) provided service twice a week and the family privately paid for additional housekeeping services once a week. The family found that the CCAC funded PSW's were more consistent when scheduled only for two days a week. When PSW visits were changed to daily, there was difficulty with timing of visits and the number of different PSWs coming in. The variety of workers led to confusion with the faller's everyday routines and personality conflicts. Faller frequently had to wait for the PSW to have her shower before dressing, "I'm not one to sit around in a housecoat and nightgown half the day while they weren't coming 'til around noon, or they wouldn't show up at all [sometimes two days in a row]. So I fired the whole works...When I get up I like to get dressed, not hang around in my nightgown". The daughter found that "the weekends were terrible, because if we wanted to take her somewhere, she'd be around here 'til noon not dressed". The PSW services were overwhelming and frustrating for the faller and family.

Community Support Services

Community PSW's had no control over their schedules. "We all run on schedules. We aren't in charge. We have to go with what is dictated", reported one PSW. Some clients required more assistance getting up, but did not always get scheduled for the early visits. A PSW had an opportunity to suggest an order for the morning visits, but the agency schedulers, who do not always know the client's needs, had the final say.

Early morning visits were difficult to cover because the agency did not have enough PSW staff. The scheduled morning visits were spread between 7:00-10:00 am in order to accommodate the number of workers scheduled for

a day, and assist PSWs to obtain enough paid hours. In order to get eight hours of pay, a PSW in the community often needs to work 12 hours. PSWs had empty and travelling time between scheduled visits, decreasing the amount of money they can earn. Driving time between clients was poorly paid. The PSWs received one extra minute of pay for every three kilometers driven. PSWs in long term care earned a wage that was a third more per hour than PSWs in community. Finding staffing for community PSW roles was difficult.

The faller made the choice to discontinue PSW services after several incidents where the faller wanted to remain in control. The faller commented during her interview, "It makes you mad you know, you used to be able to do a lot of stuff,and now you can hardly do nothing". When asked how she was coping without the PSW the faller replied "I get along fine". The interviewed PSW reported she could understand why some older individuals wish to discontinue their services. Individuals can get mad at the events that have happened to them, the person may feel they can still do things for themselves, and they did not like others to interfere with their home. The person may not like how PSW was doing something, they wanted to remain in control of their own situation, but were not given control. The PSW reported that most often the elderly person needed help, but was mad at the situation and how they have deteriorated, not the PSW. The faller indeed needed the help, now her family was taking on the additional responsibilities.

Family

The faller's family was very supportive. One younger daughter lived across the street and was able to come in daily to assist with the faller's night routine. When the faller fired daily CCAC PSW support, the faller's son assisted with the morning routine. When the son found a new job, the younger and older daughter assisted more. Though this situation worked well for the faller, the daughters were having difficulty collaborating due to misunderstanding each other's goals. The faller complained to each daughter about what the other daughter was doing. In the process the faller would mix up some facts, resulting in the daughters not talking to each other. Lack of communication made things difficult.

Nonetheless, the children were a good support. When the faller fired all PSWs, the family supported her decision. When the CCAC called back for a one month follow-up, the family remained committed to provide the supports needed. The faller was more empowered now that she was in control of her own schedule and able to choose what to complete on what day, rather than be instructed what to do. The son-in-law saw the faller as an independent-minded person and did 'not blame her a bit' for her choice, "you have to be careful, when you start to thinking of ways to help them [seniors] because sometimes you take away their independence and that makes them more resistive and makes them angry...so if you can help them to keep some of their independence, that's what we need to be doing." Increased supervision and activity restrictions were not seen by the family as a suitable way to prevent further falls, but changes were made when necessary. After the fall, the son-in-law rearranged the faller's bedroom and relocated TUMS to the kitchen counter for easier access.

OT and PT Community Services

An occupational therapist (OT) was responsible for ensuring the home environment was safe for the client after her stroke. The CCAC funded OT had been in the first day the client came home after stroke. The OT felt that the home was well set-up and all necessary aids were in place for bathroom and mobility safety. The home had a ramp at the entrance, and many aids to assist with fall prevention, i.e., wall bars, tub seat, commode, electric lift chair, and bed rail. The use of TUMS, stored in her bedroom, was not discussed at that time. This was a small detail of her daily life, and was not part of the standard initial OT assessment. The OT's visit on the faller's first day home focused on the larger home environment and equipment safety. The faller had not been home long enough to determine what other tasks she would find difficult. Follow-up OT visit was not completed because the faller was overwhelmed with the number of different people coming into the house. The OT closed the file recommending that the CCAC re-refer this client if safety issues arose.

Another OT from the Community Stroke Rehabilitation Team (CSRT) was also involved with the client. This OT's focus was on upper extremity function for community re-integration. The CSRT OT did not assess the client's environment, as she was under the understanding the CCAC funded OT visit had addressed this area. An OT home exercise routine was prescribed which the faller was not motivated to complete consistently.

CCAC funded physical therapist (PT) was sent in to address strength and stair safety when the faller returned home from the hospital. The PT saw the client for six visits in the month of February and then discharged her. Upon completion of treatment, the PT noted increased strength in the faller's left leg and reported the faller was safe on stairs with a railing. However, in May 2012 the older daughter and the son noticed a gradual worsening of the faller's mobility, exacerbated by the fact that the faller was not following up with prescribed home PT exercises. The faller was always tired after going out, and her walking was "not great" when she was fatigued.

SFIM

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Swiss Cheese Report

Organizational Factors:

- Provider agency assigns multiple PSWs with variable schedules to the faller.
- PSW visit lengths are rigid and pre-determined by the CCAC according to the care plan the client is eligible to receive.
- PSW staffing levels are too low to visit all clients between ideal morning visit times (7-9 am).
- Scheduling of PSW visits does not take into account PSW recommendations or client desires.
- PSWs would not have enough work hours if all morning visits were completed within the ideal visit time slots (7-9 pm).
- Community PSWs need to work 12 hours for 8 hours of pay, as travel time and down time between clients is not paid.

Supervision:

- CCAC OT is unable to follow up and assess client's functional safety needs as faller settles into her new routine.
- PSW instructed the faller to remain undressed until she arrives to assist with shower.
- Family are unaware that shelf access is difficult for the faller.
- OT is unaware that shelf is difficult for faller to access.

Preconditions:

- Faller is deconditioned.
- Faller has poor balance.
- Faller has a history of falls.
- Faller has history of cellulitis.
- Faller has frequent bladder infections.
- Faller takes 11 medications.
- Faller has a strong personality and need for independence.
- Faller is overwhelmed by the different support workers and therapists coming in and out of her home.
- Faller waits for PSW assistance every day between February and May, 2012.
- Faller is frustrated with the inconsistent timing of PSW visits.
- Faller feels that she has no control over her own schedule.
- Timing of the morning PSW visits is inconsistent.
- TUMS storage location is the same post stroke as it was pre-stroke.
- Faller is tired after day program.
- When fatigued, faller has trouble walking safely with her rollator walker.
- A chair blocks access to the storage shelf.
- The chair in front of the storage shelf is set about 20 cm forward of the shelf.
- Faller has left sided weakness.
- Faller is a stroke survivor.
- Faller has decreased range of motion in her right shoulder.
- Faller has arthritis.
- Faller frequently has upset stomach requiring use of TUMS.

- TUMS are stored on a difficult to access shelf.

Unsafe Acts:

- Faller inconsistently follows prescribed home physical therapy exercise program. Feb-May, 2012
- Faller declines CCAC OT attempts to schedule follow up visit. Feb-Mar, 2012
- Faller postpones dressing until the PSW arrives to assist with her shower. May 6, 2012
- Faller fires personal support workers. May 7, 2012
- Faller walks to the bedroom to get TUMS. 14:22
- Faller grasps chair in front of storage shelf with left hand. 14:24
- Faller reaches forward, behind the chair with her right hand. 14:24

SFIM

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Conclusions

The Faller, an 88-year-old lady, fell in her home on the afternoon of May 10, 2012 while reaching for a container of TUMS. She had recently returned home from the Adult Day Program, and her stomach was upset. She walked to the bedroom where she leaned on the back of a chair with her left hand as she reached forward with her right hand to a narrow shelving unit in the corner. As she grasped the container of TUMS, she straightened up, lost her balance and fell backward to the left side, pulling the chair with her. She was able to use her Lifeline and obtain assistance from her family, who lived across the road, to stand up. Medical attention was not required after the fall.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

- * The faller had a number of health related preconditions which contributed to the fall: arthritis, decrease range of motion in her right shoulder, decreased endurance, poor balance which noticeably worsened when the faller was fatigued, 11 medications, re-occurring upset stomach, a stroke with residual left side weakness and decreased coordination (Dec 31, 2012), and history of frequent bladder infections and cellulitis.

- * The faller's actions and decisions also contributed to the investigated fall: she did not follow up with home exercise routines, she stored the frequently used TUMS in an awkward location, she 'fired' her daily PSW support and declined follow up attempts by the CCAC OT.

These person-related factors were linked with the following factors at the supervision and organizational levels.

- * OT only completed initial assessment and there were no follow-up visits. The initial OT services offered by the CCAC after faller's stroke focused on equipment needs and mobility safety within the home. The location of frequently used items, such as her TUMS, was not discussed. Attempts for further follow-up from this OT were declined by the client, as the client was overwhelmed by the number of people coming into her home.

- * Multiple PSWs were assigned to the faller. Daily PSW visits were hard to cover with a consistent time and staff member. New clients with daily visits needed to be scheduled within existing time schedules of PSWs. If more PSWs were made available to cover the 'ideal' morning preparation hours (7-9 am), there would be fewer hours of work for each PSW. The PSWs who want eight hours of pay a day have to work approximately twelve hours a day to have enough hours of 'paid' time.

- * PSW visit time to faller's home varied each day. The faller was asked to not dress until the PSW arrived to assist with the bath. The faller did not like waiting in her night clothes for the PSW to arrive, sometimes in the late morning and sometimes not at all. PSW hours were scheduled by the agency scheduler who was not familiar with the individual requiring service, and were not under the control of the PSWs.

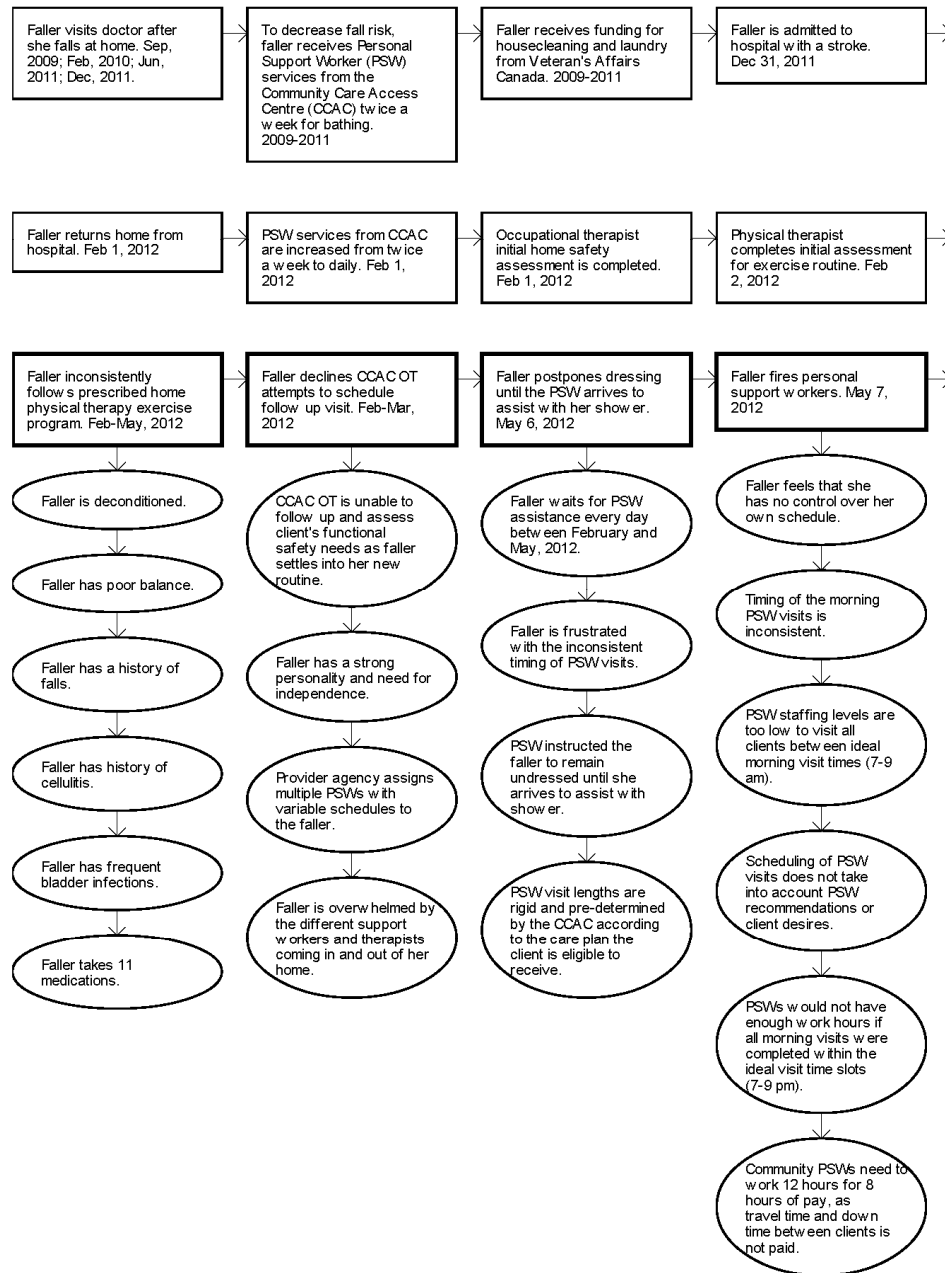
- * Family left TUMS in the faller's pre-stroke storage location. Faller's family were unaware of the difficulty the faller had in accessing TUMS. The family were in twice a day or more to assist the faller with other activities (glucose check, insulin shot, meals, letting the dog out). Extra details to daily tasks were addressed as they arose, such as moving the microwave for easier access.

- * There was a lack of caregiver assistance after the day program, when the faller was more fatigued. A day program worker ensured the client entered the home safely, but does not assist with in home tasks.

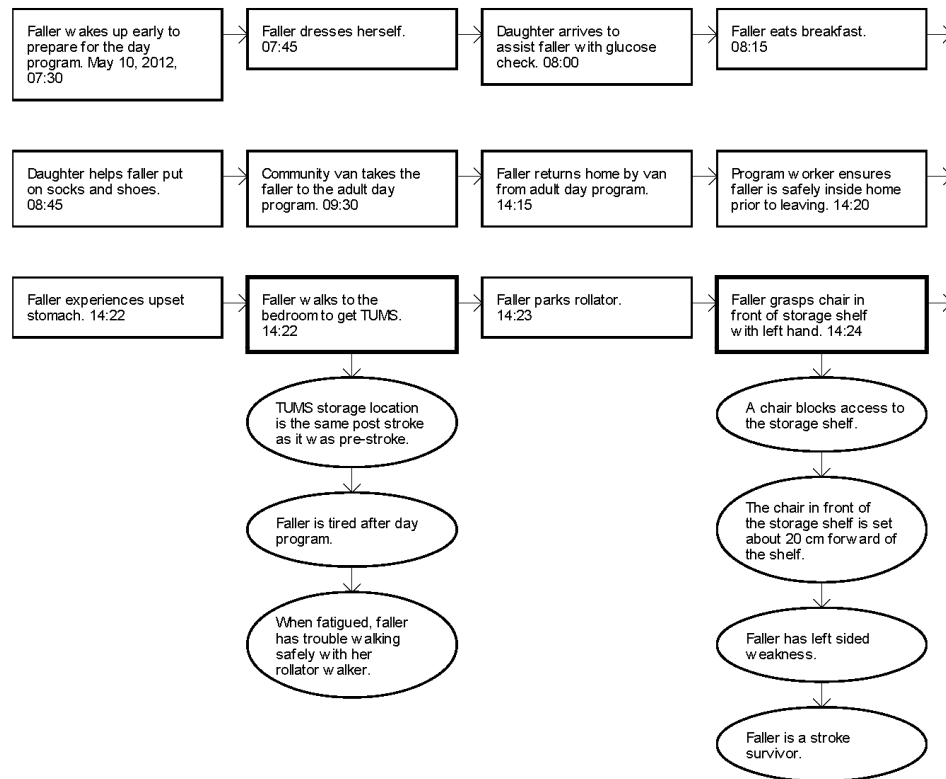
Unsafe actions and decisions combined with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.



Sequence of Events: 16259



16259 1/3





Appendix R: Mrs. Bee Full SFIM Report

SFIM

Case ID: 8100812

Date: 2013-04-03

Subject #: 16383

Fall Information

2.1 Date of the fall: 2012-05-24

2.2 Day: Thursday

2.3 Time of fall: 24-hour clock

22:30

2.4 Witnesses: ☒ Witnessed

Number of people at the scene? 2

2.5 Location of the fall: ☒ Indoors☐ Private Residence☐ Kitchen

2.6 Activity at the time of the fall:

☒ Standing on both feet2.6a Was this person multi-tasking? ☒ No

2.7 Action by the faller prior to loss of balance:

☒ Walking (task-oriented)

2.8 Type of fall:

☒ Trip

2.9 Direction of the fall:

☒ Forward

2.10 Environment at the fall location:

☒ Not applicable (environment was in good condition)

2.11 Mobility aid used at the time of the fall:

☒ Wheelchair

Walking behind transport wheelchair-not sitting.

2.12 Footwear worn by the faller at the time of the fall:

☒ Socks only

2.13 How did faller get up after the fall?

☒ Assisted by another person

☒ Family/Friend/Roommate

Please specify how the faller was assisted:

☒ Manual Aide (e.g. cane/walker/wheelchair)

2.14 Injury? ☒ Yes

2.15 Injury severity:

☒ Moderate - required medical attention (e.g. strain, extensive bruising, laceration, bleeding, burn, chipped tooth)

2.16 Injury type:

☒ Bruise

☒ Pain

2.17 Injury location:☒ Lower back☒ Leg, knee, foot, toe(s) ☐ Left**2.18 Type of medical attention received:**☒ ER visit only**2.19 Was something new or unusual related to this situation? (e.g. new environment, doing something for the first time, new medication, new timing, etc.)**☐ Yes, please specify:

Does not usually clean up in kitchen at bedtime.

SFIM

Case ID: 8100812

Date: 2013-04-03

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Information About the Faller**3.1. Demographics:**Year of birth: 1928 Age Calculated: 84Gender: ☒ FemalePopulation: ☒ Senior**3.2 Falls history:**☒ Rare faller (fell only this one time in the past year)**3.4 Marital status:**☒ Married**3.5 Mental status:**☒ Normal, alert and oriented**3.6 MMSE score:**26**3.7 Education:**☒ College or equivalent completed**3.8 Mobility aids:**☒ Cane☒ Occasionally☒ Walker with 4 wheels for indoor or outdoor use (rollator) ☒ Occasionally☒ Wheelchair☒ All of the time**3.9 Other aids used by the faller:**☒ Bath bench/shower seat☒ Bathroom grab bar☒ Hearing aid

☒ Raised toilet seat/Commode

☒ Rubber bathmat

3.10 Medical problem at the time of the fall:

☒ Arthritis

☒ Osteoarthritis

☒ Heart conditions

☒ Pain

☒ Poor Vision (cataracts, glaucoma, astigmatism, conjunctivitis)

Faller has 10% vision due to macular degeneration.

3.11 Medications:

11 Number of prescription medications used by the faller on the day of the fall

☒ Medication Name: Metformin
☒ Medication Name: Tecta
☒ Medication Name: Pantoprazole Magnesium
☒ Medication Name: Lipitor
☒ Medication Name: Monacor
☒ Medication Name: Zestoretic
☒ Medication Name: Synthroid
☒ Medication Name: Nitro patch
☒ Medication Name: Symbicort
☒ Medication Name: Nitro spray
☒ Medication Name: Salbutamol INH

1 Number of over-the-counter medications used by the faller on the day of the fall

☒ Medication Name: Aspirin

SFIM

Case ID: 8100812

Date: 2013-04-03

Subject #: 16383

Investigative Report Summary

On May 24, 2012 the faller fell in her home while helping her husband to put away the supper leftovers before going to bed. She walked to the kitchen holding onto a transport wheelchair for support when she tripped. The wheelchair moved ahead and she landed on the ground. With the use of a kitchen chair and her husband's assistance, she was able to get up and continued to prepare for and go to bed. She awoke during the night unable to get out of bed to use the bathroom. The pain in her back prevented her from completing the transfer necessary to exit out of bed. A visit to the emergency department with her husband revealed no back fracture, but the pain continued to prevent her from completing many activities, even a week after the fall.

Faller

Faller was an 84-year-old lady who lived with her 88-year-old husband in a two story home. The faller and her husband were inter-dependent on one another and worked as a team to complete daily household tasks. She commented, "He's not crazy to help with the meals, but he does. We work it out". The faller had macular degeneration and only 10% vision. She found ways to manage many tasks independently, e.g., playing computer games with the screen magnified to very large (one solitaire card would be about 5" high). However, there were some things she could not do. For example, she relied on her husband's vision to inform her when meat was cooked, and he managed her daily medications. A daughter came every two weeks to clean the house. One son came in weekly to assist with chores around the home as needed.

Faller had a history of falls resulting in multiple vertebral fractures. Her first fall was 10 years ago in another residence, when she fell down the stairs. The second fall was 3 years ago, when she was assisting her husband to stand up after he had fallen outside. Instead of getting him up, they both ended up on the ground. She had profound back pain since that fall. Initially, a rollator walker was prescribed by physical therapist to help her with mobility. Eventually, she became mobile with a cane for short distances. She also used an AMG Airgo transport wheelchair, given to her by a family member for longer community outings.

In the fall of 2011 her husband began to use the faller's rollator walker to assist with his mobility later in the day and the faller started using the transport wheelchair inside the house. She enjoyed the fact that she could either walk behind it or sit down and use her feet to move around. The faller felt that an additional walker for her husband's personal use may have been nice "but that's another piece of equipment that's a hazard to me". Due to her decreased vision, she felt that two walkers, in addition to a transport wheelchair and their large family dog would be too many potentially obstacles to trip on.

The faller had cataract surgery on May 17, 2012, one week before her fall. She was instructed by her doctor that she would require eye drops four times a day, and that she would need to be extra careful as her vision would be worse for 1-2 weeks before it improves. Her husband helped with the administration of two types of eye drops four times a day, it was "a lot of trouble for him putting all those drops in". The faller was extra careful, more attentive to her tasks, but after the fall she realized that she did not know how to accommodate, "we really just carried on with our usual routine". The faller felt "a little guilty" about not helping her husband more as "it's hard on him... he's frailer [too]". The evening of the fall the couple were "cranky" with one another "we were a little stressed [with the extra efforts needed for daily tasks]". The faller was also irritated that the leftovers were not put away before sitting down for the evening news. This stress and irritation affected her mobility and her ability to focus on being extra cautious.

Staying mobile with healthcare system support

In 2009 after a fall outside which injured her back, the faller completed physiotherapy (PT) exercises at home through the Community Care Access Center (CCAC). As she improved, she followed up with PT at an out-patient clinic. She discontinued the out-patient PT exercises after a few visits, as she found the home exercise routine prescribed would cause her back muscles to spasm after only three repetitions. The pain would limit all further activities that day. The faller was knowledgeable about the need to stay active and considered her options as she

noticed her activity level gradually decrease between 2009-2012. She considered pool therapy, having enjoyed it in the past when she could drive independently. But “the effort to get there and change, and get in and out and dressed, it all seemed too much to me”. She also considered a “Get Fit” class hosted by a local long term care facility and geared towards seniors, but found the long walk across the parking lot too much for her. As well, classes started at 9:00 am, which was too early for her husband to provide transportation. She did go to her family physician for advice on an appropriate direction to prevent deterioration. An appointment was completed in March 2012. The physician ordered a CAT scan of her spine, to determine the cause of her back pain. He also recommended an assessment with a pain clinic. The CAT scan results revealed four previous vertebral fractures, osteopenia and stenosis of the lumbar spine. The pain clinic sent a referral package for the faller to complete. When the package arrived, the faller and her husband felt the package was too much effort to complete “must have been ten pages long...unbelievable”. In addition, the drive to the pain clinic would have been 45 minutes. To further rationalize her decision, the faller did not classify her pain as uncontrollable. She felt “lucky” to still be able to participate in some social activities where she used her walker, and was sitting when she got there to relieve back pain. Between her understanding that pain clinics were only for people with “uncontrollable” pain, the lengthy referral package and the long drive, she decided not to follow up with the pain clinic option. The faller’s goal was to stay active and improve her mobility. She knew that by staying in their own home the couple would be less costly to the healthcare system. She attempted to find different ways to stay active, but ran into hurdles preventing her from accomplishing this goal.

Transport Wheelchair

Transport wheelchairs are not designed for independent mobility, but for use with an attendant. The brakes are located low on the back wheels, and designed to be operated by the caregiver pushing the wheelchair. The faller received a transport wheelchair from a family member without any safety instructions. Any verbal or written instructions that came with the wheelchair were not passed along. The faller was not aware of the safety hazards related to using of this style of wheelchair independently. When an individual utilizes a transport wheelchair independently, the brakes cannot be engaged, increasing an individual’s risk of a fall when transferring in and out of the seat. When used as a rollator walker the brakes are not quickly accessible to slow or stop the wheelchair. A rollator walker has brake access located on the handles. A transport wheelchair rollator walker combo was available on the market, but the faller was not aware of this mobility aid. One local vendor who sold the combo style walker, reported that the style was client specific, and was not usually taken to events meant to educate seniors on safety aids available for purchase. Another local store did not have the transport wheelchair rollator walker combo available in the store.

Post-Operative Assistance to Caregiver/Care-receiver Dyad

The ophthalmologist recommended to the faller to be extra cautious post cataract surgery. He did not discuss the need to arrange extra assistance in the home. The secretary at the ophthalmologist office reported that extra help was sometimes requested from the CCAC for individuals already on the CCAC program or for an individual with a disability, but these requests were not part of standard procedure. The secretary reported that the CCAC assistance offered for standard cataract surgery would be limited to only one visit to show a patient or the caregiver how to administer eye drops, and that daily assistance was not available, unless an individual was physically unable to perform the task. In this case the faller’s husband was physically able to assist with eye drops so the couple were not eligible for CCAC services. But after a week of managing within the home post-surgery the couple became “stressed” by the extra requirements, which affected their usual inter-dependent relationship. Two independent older adults were left to manage on their own in a time of increased need.

You may upload up to 3 pictures related to this case. Pictures must be no larger than 150 KB

[holding transport wc walking.jpg](#)

[transport wc at counter edge.jpg](#)

SFIM

Case ID: 8100812

Date: 2013-04-03

Subject #: 16383

Swiss Cheese Report

Organizational
Factors:

- There is no policy for provision of appropriate safety training to seniors acquiring assistive devices second hand.
- Cataract pre-operative procedure does not include discussion about options for post-operative home help.

Supervision:

- Family member gave the transport wheelchair to the faller without safety instructions.
- Faller was unaware of the benefits the pain control clinic could provide.
- Physician instructs faller to be extra careful and watch her balance.
- Husband has multiple health issues.
- Husband has been putting two sets of eye drops in faller's eyes four times a day.
- Husband is fatigued.
- Husband has been completing more cooking and tidying in the past week.
- Duo function rollator/wheelchairs are poorly marketed by local health care equipment vendors.

Preconditions:

- After completing a full set of physiotherapy exercises for her back, the pain limits her ability to engage in other tasks that day.
- Faller experiences back muscle spasms when her activity level is too high.
- Transport wheelchairs are designed to be operated by a caregiver, not wheelchair user.
- Transport wheelchair brakes can only be put on from the back of the chair.
- Transport wheelchair brakes need to be locked for safe transfers.
- Faller thought her pain, though uncomfortable and limiting, was controllable.
- Faller believed that pain clinics were for individuals with uncontrollable pain.
- Faller was overwhelmed with a 10 page referral package one was asked to complete prior to an assessment at the pain clinic.
- Faller believed that the effort to fill out the application and drive 45 minutes to the pain clinic was not worth the possible gains.
- The pamphlet given post cataract surgery instructs that normal activities may be continued, but to avoid lifting and strenuous exercise for four weeks.
- Faller's vision is further impaired in first 2 weeks after cataract surgery.
- Faller only has 10% vision due to macular degeneration.
- Faller and husband are interdependent in Instrumental Activities of Daily Living (IADLs).
- Faller is tired as it is 22:30.
- Faller and husband are both cranky and feeling stressed.
- Faller thinks a new walker for her husband in addition to her current walker and transport wheelchair would be a tripping hazard in the home.
- Too many assistive devices create obstacles for a person with a visual impairment.
- Faller has poor mobility.
- Faller has decreased strength.

Unsafe Acts:

- Faller discontinues back exercises prescribed by physiotherapist. 2009
- Faller uses a transport wheelchair within the home as a mobility aid. 2011-2012
- Faller declines pain management clinic appointment arranged by family physician. Apr, 2012
- Faller has cataract surgery. May 17, 2012
- Faller helps husband beyond her post-operative functional capacity.
- Faller and husband prepare crock pot for supper. May 24, 2012 10:00
- Faller gets up to assist husband. 22:30
- Husband has been using the faller's walker for mobility later in the day.
- Faller likes to walk with the transport wheelchair, as it allows her to sit when her back aches.
- Faller walks from living room to kitchen holding handles of transport wheelchair for support. 22:31
- Faller trips on her feet. 22:32

SFIM

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Conclusions

The faller, an 84-year-old living with her husband fell forward while walking in the kitchen with her transport wheelchair the evening of May 24, 2012. The faller had had cataract surgery the week previous to her fall, causing extra stress on her husband and herself. The couple had been interdependent on one another, and the eye surgery required extra work for the husband, who had his own health issues. The faller was feeling a little guilty, and even though tired, she wanted to help her husband out in the kitchen before going to bed. While attempting to help him out, she tripped on her feet while holding her AMG Airgo transport wheelchair and fell forward. The transport wheelchair moved ahead of her and did not provide support to stop her fall. In the middle of the night, her husband took her to the emergency department, as faller was unable to transfer out of her bed secondary to severe pain.

This event was investigated using the Systemic Falls Investigative Method (SFIM). Multiple contributing factors were identified and they included deficiencies within all four levels of the Swiss Cheese Model of Accident Causation; unsafe acts and decisions, preconditions, supervision and organizational influences.

The faller had a number of health related preconditions which contributed to the fall: macular degeneration in addition to the recent cataract surgery, a previous fall three years ago resulting in fractured vertebrae and subsequent back pain that spasms when her activity level is too high. On the night of the fall the faller was tired and irritable.

The faller's actions and decisions also contributed to the investigated fall: she ambulated around the house holding a transport wheelchair, she discontinued her physical therapy exercises, she did not follow up with completing an application to a pain management clinic, and after her cataract surgery she did not limit her daily activities or ask for increased assistance from other family members, friends or the Community Care Access Centre (CCAC).

These person-related factors were linked with the following factors at the supervision and organizational levels.

- * Family physician and ophthalmologist assumed the faller could manage after her cataract surgery with her current level of support. Options for in home help to decrease the burden on the faller and her older husband after surgery were not reviewed or encouraged. The faller was of the understanding that being extra cautious after her eye surgery would be enough to keep her safe. The couple were interdependent on each other for daily tasks, and the couple's strategy for completing tasks together was disrupted after the faller's eye surgery.

- * CCAC services were mandated for personal care assistance only. As long as an individual within the home was physically capable of administering the post-surgery eye drops CCAC had no involvement. While the husband was able to assist, he had his own endurance issues and after a week of four times a day eye drops, in addition to the regular household tasks, he was at his limit. The couple were becoming stressed and irritable with each other, which increased the faller's fall risk as she attempted a task late in the day, beyond her limits.

- * Family continued with original level of support for the inter-dependent couple. After the cataract surgery the co-dependent balance had changed for the faller and her spouse; this resulted in an increased need for assistance. This lack of assistance increased the stressors leading to the fall.

- * Vendors rarely showed the walker-transport wheelchair aid, as the aid was seen as a specialty item. Transport wheelchair rollator combo options were not a well-known safety alternative. The faller was unaware of a walker-transport wheelchair duo mobility aid for use within the house. The faller chose to use a transport wheelchair as it allowed her to sit and foot propel herself around when her back ached. She did not want a walker in addition to this wheelchair, as she was concerned about increasing her fall risk due to too many pieces of equipment to potentially trip on with her decreased vision. Use of the combo aid allows access to brakes, decreasing her risk of falling.

- * Instructions did not accompany the second-hand assistive device when it was given to her by a family member. Seniors and/or their families need to be advised that when selling or passing on an assistive device, the original instructions need to accompany the item. Policies need to be established for appropriate training of seniors who purchase or receive second-hand devices.

- * Transport wheelchair lacked a permanent safety label. The transport wheelchair manufacturer did have a safety instructions page for transport wheelchairs, recommending caregiver assistance, but not a permanent safety label on the assistive device instructing the user to have assistance of another person to apply brakes for transfers, and to not use the aid as a rollator walker.

Unsafe actions and decisions linked with contributing conditions at all four levels of the Swiss Cheese Model of Accident Causation and resulted in this adverse event. Mitigating these acts and conditions would improve the safety of this faller, as well as contribute to betterment of safety for other community-dwelling older adults.



Airgo®

For who you are & what you need...

(1H) Steel Transport Chair

For proper assembly, ask to someone you really know some instructions.

(2) Fauteuil de transport en acier

Pour une assemblée correcte, demandez à une personne que vous connaissez bien les instructions.

(3) Silla de transporte de acero

Para una montaje seguro y correcto, pida instrucciones a alguien.

(1) Sedia da trasporto in acciaio

Per un montaggio corretto e per questioni di sicurezza, chiedi a qualcuno che tu conosca bene le istruzioni di montaggio.

(2C) Transportstuhl aus Metall

Für eine korrekte Montage und aus Sicherheitsgründen bitten Sie um Hilfe bei der Montage.

(3L) Silla de transporte

Para un montaje seguro y correcto, pida instrucciones a alguien que usted conozca.

(1H)

- A. Headrest
- B. Backrest
- C. Armrest
- D. Seat
- E. Seat frame base
- F. Footrest base
- G. Wheelchair
- H. Backrest
- I. Backrest
- J. Backrest
- K. Backrest
- L. Backrest
- M. Backrest
- N. Backrest

(2C)

- A. Headrest
- B. Backrest
- C. Armrest
- D. Seat
- E. Seat frame base
- F. Footrest base
- G. Wheelchair
- H. Backrest
- I. Backrest
- J. Backrest
- K. Backrest
- L. Backrest
- M. Backrest
- N. Backrest

(1)

- A. Headrest
- B. Backrest
- C. Armrest
- D. Seat
- E. Seat frame base
- F. Footrest base
- G. Wheelchair
- H. Backrest
- I. Backrest
- J. Backrest
- K. Backrest
- L. Backrest
- M. Backrest
- N. Backrest

(2)

- A. Headrest
- B. Backrest
- C. Armrest
- D. Seat
- E. Seat frame base
- F. Footrest base
- G. Wheelchair
- H. Backrest
- I. Backrest
- J. Backrest
- K. Backrest
- L. Backrest
- M. Backrest
- N. Backrest

(3)

- A. Headrest
- B. Backrest
- C. Armrest
- D. Seat
- E. Seat frame base
- F. Footrest base
- G. Wheelchair
- H. Backrest
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- L. Backrest
- M. Backrest
- N. Backrest

(3)

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- D. Seat
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- G. Wheelchair
- H. Backrest
- I. Backrest
- J. Backrest
- K. Backrest
- L. Backrest
- M. Backrest
- N. Backrest

SAFETY PRECAUTIONS - CONSIGNES DE SÉCURITÉ

ISTRUZIONI DI SICUREZZA - PRECAUZIONI DI SICUREZZA

(1H)

1. Before using the wheelchair, read the instructions carefully. Do not use the wheelchair if you do not understand the instructions. If you have any doubts, ask someone you really know for help.

2. Do not use the wheelchair on uneven ground or on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

3. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

4. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

5. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

6. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

7. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

8. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

(1)

1. Before using the wheelchair, read the instructions carefully. Do not use the wheelchair if you do not understand the instructions. If you have any doubts, ask someone you really know for help.

2. Do not use the wheelchair on uneven ground or on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

3. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

4. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

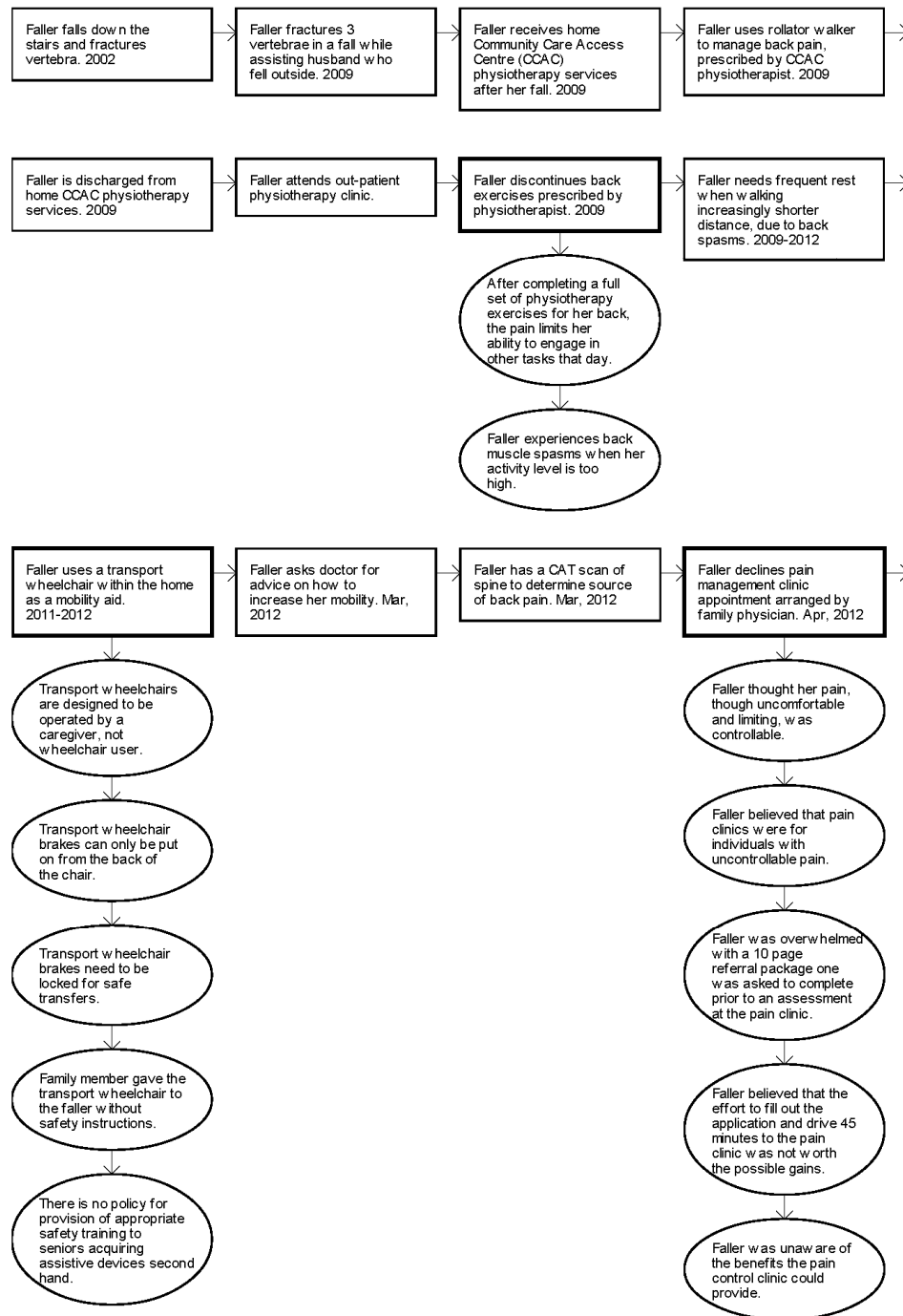
5. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

6. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

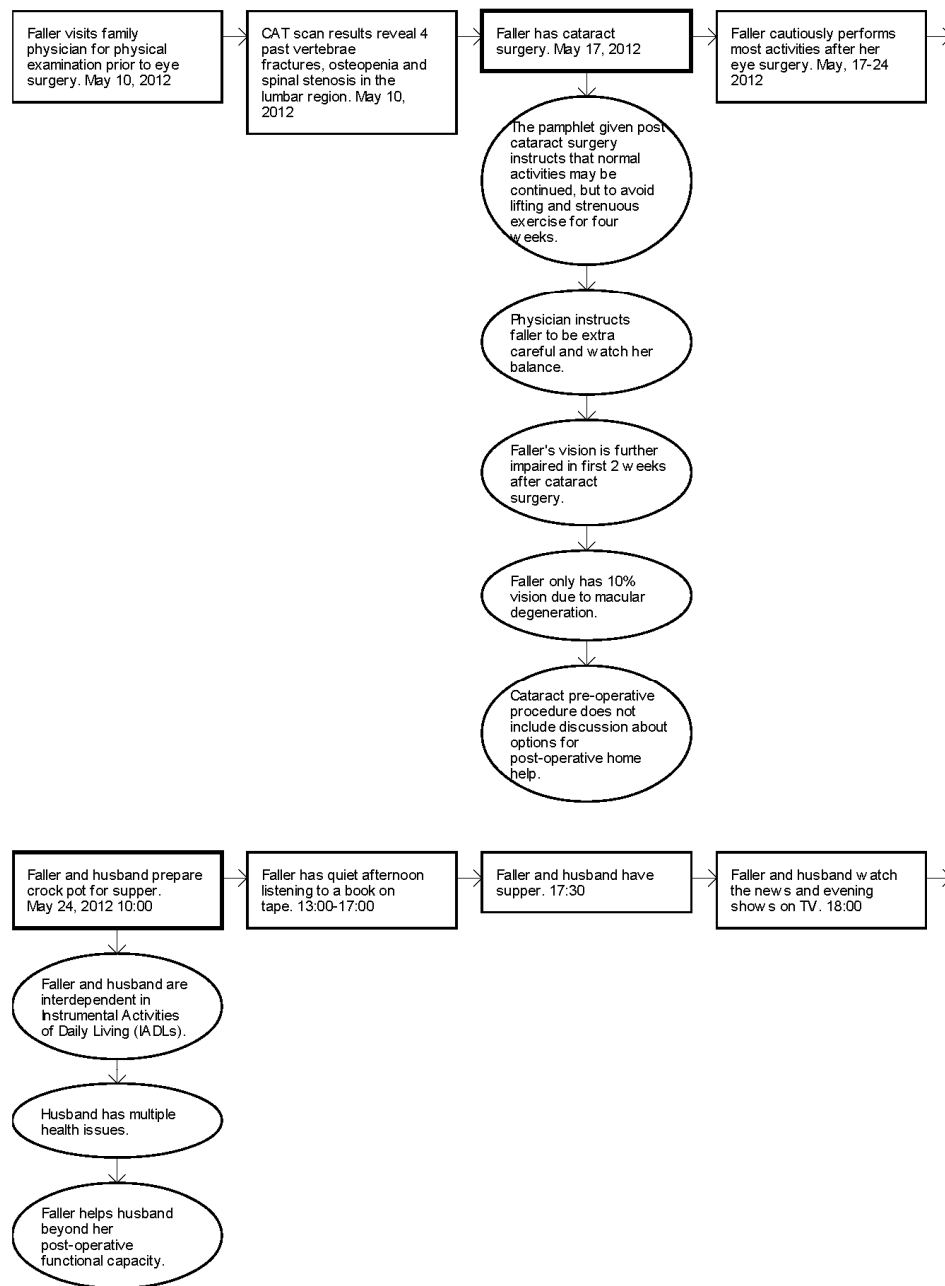
7. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

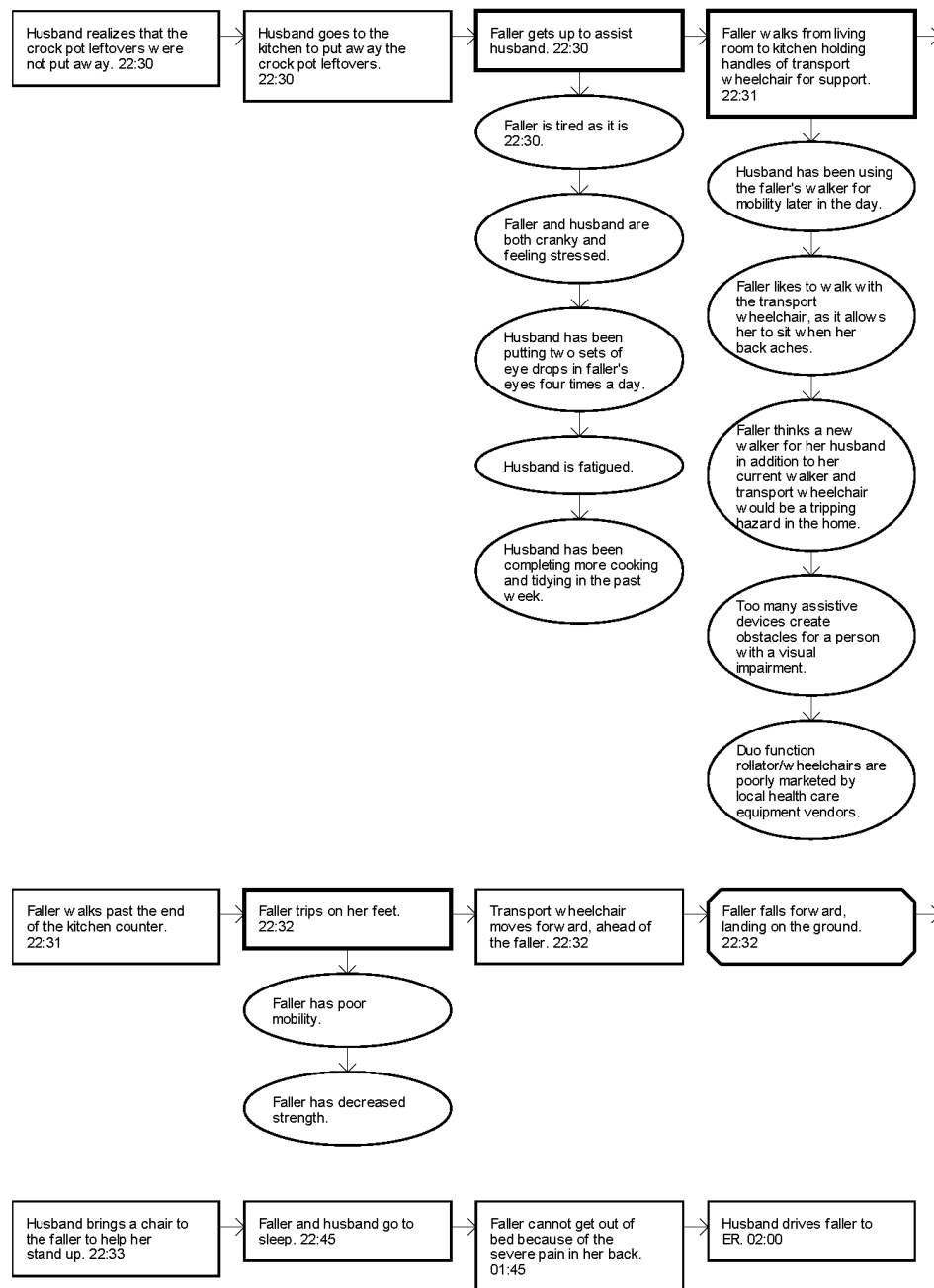
8. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat. Do not use the wheelchair on a surface that is not flat.

Sequence of Events: 16383



16383 1/3





Appendix S: Description of Codes Used to Identify Patterns and Similarities Among Factors
that Contributed to Falls in Older Adults

Code	Sub-codes	Description	Link to final themes
1. Maladaptive Choices	A: wanting to stay independent	A potentially inappropriate choice made with the intention/desire to keep ones independence; not wanting to accept functional changes that are occurring as one ages.	1
	B: choosing to accept personal risk	A potentially inappropriate choice related to personal preference is made in disregard to known risks; personal preference supersedes potential risk; the risk is judged to be worthwhile.	1
	C: making the best of it	A potentially inappropriate choice is made to compensate for something that is felt to be unchangeable or to accommodate other choices made.	1
	D: thinking they were doing the right thing	A potentially inappropriate choice made with the intention of doing the right thing, unaware of the potential risky consequence of the choice.	1
2. Faller's personal factors	A: body functions and body structures	Includes disease (acute or chronic), disorder, injury, trauma; physical and/or cognitive limitations resulting from impairments in body function or body structure.	1
	B: interpersonal/ intrapersonal interactions	Includes any interpersonal relationships issues; personalities.	1
	C: pharmaceutical matters	Includes medication errors, events, and polypharmacy.	1
3. Faller's physical environmental factors	A: fixed/predetermined human-made physical factors	Related to structural issues that are not easy to change without construction.	1
	B: adaptable/ changeable human-made physical factors	Related to the set-up of the environment and the items in it.	4
	C: natural world factors	Related to physical factors beyond control of humans.	1
	D: product and technology factors	Related to equipment and technology used.	1
4. Inadequate policies for safety of older persons (laissez faire attitude of society)	A: supportive housing	Relates to the physical features and design features that are inadequate for meeting the needs of adults with health issues, within a building designated as a supportive housing environment for older persons.	4
	B: building codes for public senior housing	Relates to lack of consideration for mandatory fixed physical design features to meet the needs of adults with health issues in public residences geared and marketed for older persons.	4

	C: identification of a person with cognitive decline and no caregiver	Relates to lack of policy and lack of an appropriate system to keep track of high risk individuals.	4
	D: additional policy topics	Relates to additional inadequate policy topics such as those related to home health safety aids and patient medical files.	4
5. Limitations in the availability of supervision	A: formal service providers	This relates to workload and scheduling issues; high workload affects interaction with care recipients, scheduling affects how a worker is able to meet a client's needs.	2
	B: no children and no spouse	Older person has no one stepping up to be the "go to" person, to accept responsibility for overseeing regular life issues.	2
	C: family caregivers	Caregiver has multiple priorities; or family do not live close by and are therefore unavailable to provide regular supervision or assistance.	2
	D: interdependence with aging spouse	Married couples can be reliant on one another, and both have physical factors that limit functioning.	2
6. Ineffectual supervision	A: yielding	Giving in to the older person's choice even though it may not be in the best interest of this person (i.e., inability to persuade an individual to follow-up with best practices); avoiding being paternalistic.	2
	B: minimal level of involvement	Only doing the basics required, not taking the extra step to be more critical.	4
7. Incomplete communication	A: resulting from unrealistic expectations for recall	Instructions are given but not written out, or given when emotions are high or when lots of information has been given; can lead to not following-up, forgetting to follow-up.	3
	B: resulting from being uninformed, undiagnosed, or the information is unavailable at time needed	Communication is lacking because an issue is undiagnosed, the information is not available, the required information is stored with another provider and not quickly accessible when required, or information is not communicated or passed on.	3
	C: resulting from poor discharge, poor care transition	An individual is discharged or care is transferred without a sufficient plan for ensuring that a high risk individual is supervised by the system.	3
	D: resulting from information that is required to ameliorate the situation not being readily evident, poor knowledge translation	Messages or programs for older persons do not reach them or are not well-known about with the result that the information needed is not evident to the individual at that moment.	3
8. Home services that did not match the lifestyle of the older person		Services that are meant to improve the lives of older persons, end up disrupting their lives; related to the lack of flexibility and highly structured supports provided by CCAC.	3
9. Doing everyday		This relates to factors that are actions or activities	

things	that the general public would not have an issue with completing; all participants were just completing everyday routines.	1
10. Other	Items that had incomplete information regarding the intention of the act and therefore could not be coded; actions that were non voluntary or automatic in nature; not a conscious decision.	

Curriculum Vitae

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